United States Department of the Interior
Bureau of Land Management

Environmental Assessment for the December 2018 Competitive Oil & Gas Lease Sale Uncompahgre Field Office

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BLM

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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CHAPTER 1 - INTRODUCTION

1.1 BACKGROUND

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 (MLA) and the Federal Land Policy and Management Act of 1976 (FLPMA), to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

The BLM Colorado State Office conducts quarterly competitive sales to lease available oil and gas parcels. A Notice of Competitive lease sale (Sale Notice), which lists lease parcels to be offered at the auction, is published by the Colorado State Office at least 45 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary, based on information available at the time, is made during the land use planning process. Constraints on leasing and any future development of split-estate parcels (private surface overlying Federal minerals) are determined by the BLM in consultation with the surface management agency or private landowner.

In the process of preparing a lease sale, the Colorado State Office sends a draft parcel list to each field office where the parcels are located. Field office staff then review the legal descriptions of the parcels to determine if they are in areas open to leasing and that appropriate stipulations have been included; verify whether any new information has become available that might change any analysis conducted during the planning process; confirm that appropriate consultations have been conducted; and identify any special resource conditions of which potential bidders should be made aware. The parcels are posted online for a 15-day public scoping period. The BLM conducts a review consistent with the National Environmental Policy Act (NEPA). Scoping comments received from the public are reviewed and incorporated into the NEPA document, as appropriate.

After the field office completes the draft parcel review and NEPA review, and makes a leasing recommendation to the Colorado State Office, a list of proposed lease parcels and associated stipulations is made available to the public through a Sale Notice, which is posted on the Colorado BLM website at:

https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/colorado

Occasionally, BLM may defer or withhold additional parcels prior to the day of the lease sale. In such cases, BLM prepares an addendum to the Sale Notice. Prior to the lease sale, the Deputy State Director signs a decision in which he or she determines which parcels are available and will be offered for lease in the upcoming sale. Available parcels not leased at the December 2018 lease sale will remain available for up to 2 years, and may be leased to any qualified lessee at the minimum bid cost. Parcels obtained in this way may be re-parceled by combining or deleting other previously offered lands. Mineral estate not leased within two years after an initial offering will no longer be available, and must go through a new competitive lease sale process before being leased.

The act of leasing does not authorize any development or use of the surface of lease lands without further application by the lessee and approval by BLM. In the future, BLM may receive Applications for Permit to Drill (APDs) for parcels that are leased. If APDs are received, BLM conducts site-specific NEPA analysis before deciding whether to approve the APDs, and what conditions of approval (COAs) to apply.

In response to expressions of interest, BLM initially considered eight parcels in the Uncompahgre Field Office (UFO) for the December 2018 Competitive Oil and Gas Lease Sale. These eight parcels were described to the public during the scoping process for this lease sale Environmental Assessment (EA) (see **Section 1.5.1**). BLM later determined that three of these parcels (8389, 8390, and 8391) had been included due to administrative error, and dropped them from further consideration. The total area of the five remaining UFO parcels is 2,830.550 acres, including 677.150 acres of public land and 2,153.400

acres of split-estate (private surface) land. See Attachment A for legal descriptions of the parcels. Attachment E presents maps of the parcels.

This EA documents the review of the proposed parcels in accordance with NEPA. It also documents BLM's verification that leasing the parcels would conform to the approved land use plan, and provides the rationale for the recommendation to offer or defer particular parcels for lease sale.

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

The UFO parcels proposed for leasing in December 2018 include portions of the following areas:

Delta County (1,137.740 acres) – Part of Parcel 8135, all of Parcel 8138

Township 12 South, Range 91 West, sections 9-11;

Gunnison County (1,692.810 acres) – Part of Parcel 8135, all of Parcels 8140, 8320, and 8351

Township 11 South, Range 90 West, section 2;
Township 12 South, Range 90 West, sections 28, 33;
Township 12 South, Range 91 West, section 12;
Township 13 South, Range 89 West, sections 3-6.

See **Attachment A** for detailed legal descriptions of the parcels initially considered. Parcel locations are shown on **Map 1**. Attachment E provides detailed maps of three distinct areas of parcels

1.3 PURPOSE AND NEED

The purpose of the Proposed Action is to consider opportunities for private individuals or companies to explore and develop Federal oil and gas resources in specific parcels underlying public or split-estate lands through a competitive leasing process.

The need for the action is to respond to the nomination or expression of interest for leasing, consistent with BLM's responsibility under the MLA, as amended, to promote the responsible development of oil and gas on the public domain to meet national, regional, and local needs. Parcels may be identified for consideration by the public, BLM, or other agencies. The MLA establishes that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with FLPMA and other applicable laws, regulations, and policies. This development is required to occur in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with FLPMA, NEPA, and applicable Federal environmental laws, regulations, and policies for the protection of other resources.

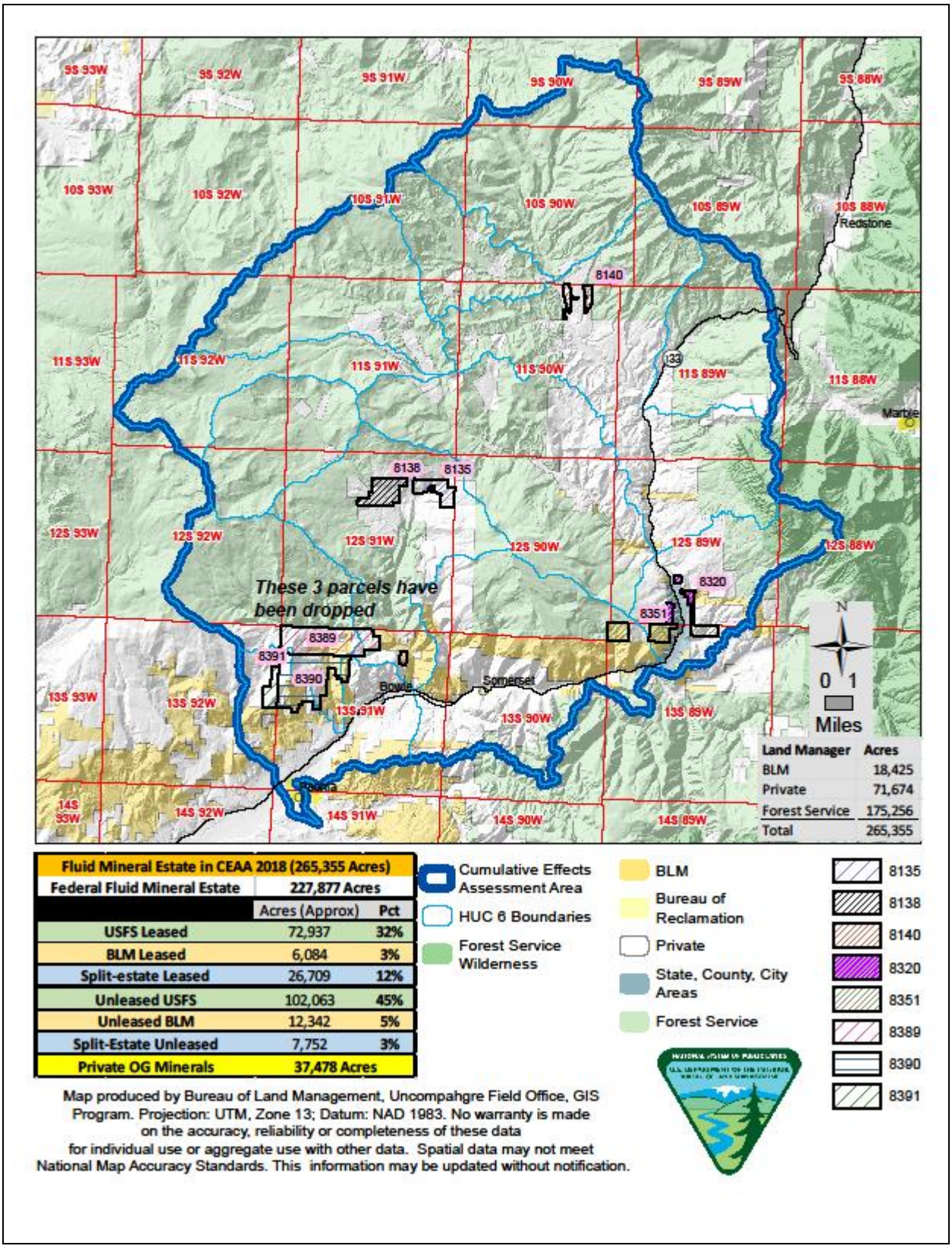
1.4 DECISIONS TO BE MADE

The BLM will decide whether to lease all, some, or none of the proposed five parcels and, if so, under what terms prescribed by the RMP.

1.5 PUBLIC PARTICIPATION

1.5.1 Scoping

The principal goal of scoping is to identify issues, concerns, and potential impacts that require detailed analysis. The BLM uses both internal and external scoping to identify potentially affected resources and associated issues. Internal scoping was conducted through discussion of the parcels by an interdisciplinary (ID) team of resource specialists. BLM conducted external scoping by posting for 15 days (from **July 2 to July 17, 2018**) on the project website the proposed lease parcels, the suite of attached stipulations derived from UFO's Draft Resource Management Plan and Draft EIS (Draft RMP/EIS), and a map of parcel locations.



Map 1. Five Proposed UFO Parcels in Relation to the Cumulative Effects Analysis Area (CEAA) – See Detailed Maps in Attachment E

As part of public scoping, BLM published a news release and posted the proposed parcel lists, legal descriptions, and maps on the project website. A notification letter containing this information was sent to selected Federal, Tribal, State, county, and local government representatives (see Chapter 4). Private surface owners whose land overlies the proposed parcels were also notified of the proposed sale.

Public scoping yielded 357 comment submissions; a smaller number was erroneously reported initially; all scoping comments were reviewed. The 357 total comments included 211 from individuals or businesses, 127 from members of a citizens' group, 9 from environmental organizations, 7 from governmental representatives, and 1 petition with 368 signatures. Names of individuals and organizations submitting comments during external Scoping are provided in Table F-6 in Attachment F.

Issues Identified and Analyzed in the EA

The issues listed below were identified during internal and external scoping, analyzed in the Preliminary EA in the sections identified, and carried forward into the Final EA.

- Air Quality and Climate Change – Section 3.4.1
- Cultural Resources and Native American religious concerns – Section 3.4.2
- Geology (including geologic hazards and induced microseismicity from hydraulic fracturing) – Section 3.4.3
- Human Health and Safety – see Section 3.4.1 (Air Quality), Section 3.4.3 (Geology), Section 3.4.11 (Transportation), Section 3.4.14 (Wastes, Hazardous or Solid), and Section 3.4.15 (Water Quality)
- Hydraulic Fracturing – see Section 3.4.3 (Geology) and Section 3.4.15 (Water Quality)
- Noise – Section 3.4.4
- Paleontological Resources – Section 3.4.5
- Ranching and Livestock Management – Section 3.4.6
- Recreation – Section 3.4.7
- Socioeconomics (quality of life, organic farming, property values, boom-and-bust cycle, North Fork Valley's "brand," and compensation for impacts) – Section 3.4.8
- Soils – Section 3.4.9
- Threatened or Endangered Fish and Wildlife Species – Section 3.4.10
- Transportation and Access – Section 3.4.11
- Vegetation (including invasive non-native species) – Section 3.4.12
- Visual Resources (including the West Elk Loop Scenic and Historic Byway) – Section 3.4.13
- Wastes, Hazardous or Solid (including unregulated rural gathering pipelines) – Section 3.4.14
- Water Quality, Surface Water and Groundwater – Section 3.4.15
- Wildlife, Aquatic and Terrestrial (including BLM sensitive species) – Section 3.4.16

Issues Considered but Not Analyzed in the EA

- Fire Management – not affected
- Forestry – not affected
- Prime or Unique Farmlands – not present
- Lands with Wilderness Characteristics – not present
- Special Status Plants – not present
- Wild and Scenic Rivers – not present
- Wilderness Areas and Wilderness Study Areas – not present
- Wild Horses and Burros – not present

The Preliminary EA included brief responses to six additional issues raised in scoping comments. The same issues were raised during the public comment period on the revised EA and are incorporated, along with BLM's current responses, into **Attachment F**.

1.5.2 Public Comment Period

The Preliminary EA and unsigned Finding of No Significant Impact (FONSI) were made available on August 27, 2018, for a 15-day public review and comment period (from **August 27 to September 11, 2018**). The document was made available review by posting online at:

https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=109681&dctmId=0b0003e8811450a0

Public comment submissions on the Preliminary EA totaled 393 and included 135 from individuals or businesses, 246 form letters from members of a citizens' group, 6 from environmental organizations, and 6 from governmental entities and elected officials. Comments were reviewed and incorporated as appropriate, into the Final EA FONSI, and Decision Record (DR). Topics raised were essentially the same as those raised during scoping (see list on previous page). In a few instances, an individual or group's scoping comment was resubmitted for the Preliminary EA. Summaries of public comments and BLM responses are presented in **Attachment F**.

CHAPTER 2 - ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the alternatives analyzed in detail. An alternative considered but not analyzed in detail is discussed in **Section 2.3**.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 *No Action Alternative*

In an EA, the No Action Alternative typically means that the Proposed Action would not take place. See BLM NEPA Handbook (H-1790-1). Under this alternative, the BLM would defer all five proposed lease parcels in the UFO from the December 2018 lease sale. Surface management of those lands would remain the same, and ongoing or previously approved but not yet implemented oil and gas development on existing Federal leases would continue.

2.2.2 Preferred Alternative

The Preferred Alternative, which drops Parcels 8389, 8390, and 8391 as having been included due to administrative error, would make available for lease sale all five parcels, which the BLM has determined are in conformance with the existing 1989 Resource Management Plan and Record of Decision (RMP/ROD), but with the application of lease stipulations developed based on recent resource information and scoping comments associated with UFO's Draft RMP/EIS (BLM 2016b). In determining that the additional No Surface Occupancy (NSO), Controlled Surface Use (CSU), and Timing Limitation (TL) stipulations were needed to ensure adequate resource protection, the BLM considered the limited number and limited scope of stipulations identified in the 1989 RMP/ROD. See **Section 2.3**.

The December 2018 lease sale currently includes one parcel entirely and one parcel partially in Delta County, totaling 1,137.74 acres entirely on split-estate (private surface) lands. The BLM also proposes to include three parcels entirely and one parcel partially in Gunnison County, containing 1,692.18 acres acres. Two of these include portions on BLM land and portions on private land; the other two parcels are entirely on private land. See **Attachment A** (Nominated Parcels with Preliminary Stipulations) and **Attachment E** (Parcel Maps). Lands nominated for lease sale were grouped into lease parcels in accordance with regulations at 43 CFR 3100.

The leases would include the standard lease terms and conditions for development of surface lands of oil and gas leases as provided in 43 CFR 3100. These would be supplemented by stipulations related to the protection of other resources and resource uses. As described above and in **Section 2.3**, internal scoping by the BLM indicated that stipulations under the 1989 RMP/ROD would not be adequate to address potential resource impacts from leasing and development of the proposed leases. Although it is not the normal practice to apply stipulations from a not-yet-completed new RMP in an oil and gas lease sale, the BLM concluded that some additional stipulations were needed to ensure appropriate protections based on analysis of recent resource information during preparation of the Draft RMP/EIS. Only three UFO-specific stipulations—related to coalmines, big game winter range, and waterfowl habitat—would apply to some or all of the parcels under the 1989 RMP/ROD.

In comparison, the Preferred Alternative would apply 20 stipulations, including six NSOs, nine CSUs, and five TLs. These include a CSU for domestic water wells that was not listed for the Preliminary EA, and elimination of an NSO for coal mines that was listed in the Preliminary EA but became inapplicable when the three parcels associated with coal mines were dropped. Other stipulations identified in UFO's Draft Proposed RMP/Final EIS would be applied, as appropriate, to the issuance of any right-of-way grants associated with possible future projects that would include roads, pipelines, or other infrastructure on BLM lands outside the lease or unit boundary. Stipulations for BLM right-of-grants are not limited to stipulations on the lease being developed and may draw from any stipulations included land use plan in effect at the time of the right-of-way action.

This includes a CSU on all lands of all parcels for domestic water wells, which was not included in the Preliminary EA. The 20 proposed stipulations are listed in **Table F-1** in **Attachment F**. Information regarding specific parts of each parcel to which the stipulations would be applied, sometimes cited as including all lands for one or more stipulations, is provided in **Attachment C**; narrative descriptions of each stipulation are presented in **Attachment D**. In addition to the 20 stipulations, BLM included one general stipulation and two lease notices that apply to all leases issued by BLM Colorado: **Exhibit CO-34** (Endangered Species Act Section 7 Consultation Stipulation), **Exhibit CO-39** (Cultural Resources Lease Notice), and **Exhibit CO-56** (Air Quality Lease Notice). All leases also would include an LN advising lessees/operators that they must comply with the Migratory Bird Treaty Act (MBTA), to protect habitat for migratory birds and their active nests.

The 20 stipulations and associated exhibits in **Attachment D** form a core of protections for resources and resource uses consistent with currently available resource information, public concerns as evidenced in scoping comments on UFO's Draft RMP/EIS and recent EIS and EA documents for proposed oil and gas projects in nearby parts of western Colorado. The BLM believes that the more comprehensive list of stipulations under the Preferred Alternative reflects responsible resource management as it has evolved over the intervening years.

2.3 ALTERNATIVE CONSIDERED BUT NOT ANALYZED IN DETAIL

In addition to dropping Parcels 8389, 8390, and 8391 from the initial list of parcels considered at scoping, the BLM considered but did not analyze in detail an alternative that would have offered all parcels administratively available for leasing, but with only standard stipulations and additional stipulations supported by known resource conditions under the 1989 RMP. Internal scoping of the five UFO parcels in relation to the stipulations identified and analyzed in the 1989 RMP/ROD indicated only the following would apply to the parcels:

- UB-10 – Lease Notice to help ensure to maximum economic recovery and safety of coalmines.
- UB-04 – Timing Limitation to prohibit development in big game crucial winter range, December 1 to April 30.
- UB-06 – Timing Limitation to prohibit development in waterfowl habitat, March 15 to June 30.

BLM resource specialists concluded, based on the analysis in UFO's Draft EIS/RMP, incorporated here by reference (BLM 2017), and internal scoping for the December 2018 lease sale that the three measures listed above, even in combination with COAs applied under BLM's regulatory authority at the time of future planning and permitting, would not provide the levels of protection currently considered necessary and appropriate. Therefore, if this alternative were analyzed in detail, all resources and resource uses other than associated with the coal mining LN and the big game and waterfowl TLs listed above would be described in Chapter 3 as having only the protections of standard stipulations, COAs, and mitigation measures. These protections would be considerably less than under the 20 NSO, CSU, and TL stipulations included in the Preferred Alternative (**Attachments C and D**).

For the reasons described above, the BLM concluded that an alternative in which parcels were leased with only stipulations available under the 1989 RMP/ROD would be inconsistent with the purpose and need (see **Section 1.4**) of making the mineral resources available for leasing and development, consistent with responsible use of the public lands and protection of other resources.

2.4 PLAN CONFORMANCE REVIEW

The Preferred Alternative was reviewed for conformance (43 CFR 1610.5-3) with the following plan:

Name of Plan: Uncompahgre Basin Resource Area Management Plan and Record of Decision (UBRA RMP/ROD).

Date Approved: July 26, 1989.

Decision Language: The Preferred Alternative and No Action Alternative described above conform to the UBRA RMP (BLM 1989) because they are specifically provided for in the planning decisions. The planning decisions to lease Federal mineral resources are determined within each management unit described in the UBRA RMP.

Management Decisions for Oil Gas, and Geothermal Resources (UBRA RMP pages 9-10): Federal oil, gas, and geothermal estate on both Federal surface and split-estate lands will be open to leasing with standard lease terms. Other conditions for leasing such as no surface occupancy and seasonal stipulations (see Appendix A of the UBRA RMP) are assigned in each management unit prescriptions; special stipulations and conditions also apply to Federal surface and split-estate lands. Any special stipulations (e.g., seasonal closures) will also apply to seismic and drilling activities. Management decisions by relevant unit (corresponding to proposed UFO lease parcels for the December 2018 lease sale) included:

- Management Unit 7, page 21 (includes all or parts of Parcel 8351) – Federal oil and gas estate will be open to leasing with lease terms.
- Management Unit 16, page 28 (includes all or parts of 8135, 8138, 8140, 8320, and 8351) – Federal oil and gas estate will be open to leasing with lease terms.

Discussion: The UFO's 1989 RMP/ROD designated the area encompassing the five parcels as open to oil and gas leasing. As noted **in Section 2.2**, the Preferred Alternative would include additional protective stipulations not included in the 1989 RMP/ROD but identified during preparation of the Draft RMP/EIS (BLM 2017) where supported by current GIS mapping or other information regarding resources, resource uses, and environmental conditions in an area.

Adding restrictions to leases issued late in the life of an RMP is supported by other actions taken by the BLM as adaptive management in response to changes in the natural and human environment through time, the evolution of public concern, and BLM's responses to public concern regarding both general and specific issues associated with oil and gas development and other land uses. For example:

- COAs for oil and gas or other projects incorporate regular updates to CPW's mapping of special habitats or areas of use, such as big game severe winter range, winter concentration areas,

production (fawning/calving) areas, and migration corridors. These typically have represented increases, not decreases, in the extent of these areas and associated COAs.

- Project-specific documents also apply the Visual Resource Management (VRM) designations applicable at the time of the project instead of those that existed when the leases were issued. BLM's VRM designations for a particular area often progress from less to more restrictive classes, resulting in additional requirements applied as COAs.
- Restrictions associated with Federally listed, proposed, or candidate threatened or endangered species often change through the life of an RMP, typically toward more species, larger areas known to support or be capable of supporting those species, better knowledge of additional vulnerabilities and threats, and additional or expanded protective measures for mitigating direct and indirect impacts. Similar increases in protections commonly apply to BLM sensitive species.
- Field Offices continually add COAs or strengthen existing COAs in response to a variety of other new or increasing public and agency concerns related to technologies, resources and resource uses, environmental conditions, human health and safety, and new regulations or policies.

While the BLM does not add new stipulations to an existing lease without the consent of the lessee/operator, protections applied to projects toward the end of an RMP's life are typically greater than when it was signed, especially for an older RMP that included relatively few stipulations.

Although the suite of stipulations in the Preferred Alternative differ from those included in the 1989 RMP/ROD, the proposed December 2018 lease sale is consistent with the 1989 RMP/ROD by making the parcels available for oil and gas leasing with lease terms. Therefore, pursuant to 40 CFR §1508.28 and §1502.21, this EA conforms to the Uncompahgre Basin Proposed Resource Management Plan and Record of Decision (BLM 1989), but with stipulations supported by the analysis in the Draft RMP/EIS.

CHAPTER 3 – AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

Council on Environmental Quality (CEQ) Regulations state that NEPA documents "must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). While many issues may arise during scoping, not all of the issues raised warrant analysis in an EA. Issues will be analyzed if (1) an analysis of the issue is necessary to make a reasoned choice between alternatives, or (2) if the issue is associated with a significant direct, indirect, or cumulative impact, or if detailed analysis is necessary to determine the significance of the impacts.

3.2 ENVIRONMENTAL CONSEQUENCES OF THE NO ACTION ALTERNATIVE

The No Action Alternative is used as the baseline for comparison of the Preferred Alternative and any other alternatives analyzed in detail. Under the No Action Alternative, the five parcels, totaling 2,830.55 acres, would not be leased. The result would be no subsequent impacts from oil and gas construction, drilling, and production activities. However, the No Action Alternative would not affect the continuation of current land and resource uses in the proposed lease areas.

BLM assumes that the No Action Alternative (no lease option) would result in less oil and gas production than under the Proposed Alternative. This alternative would therefore not provide royalty payments and would increase the potential for Federal minerals to be drained by wells on adjacent private or State lands. The public's demand for oil and gas is not expected to be affected by whether this alternative or the Preferred Alternative is selected and implemented. Oil and gas consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demographics, geopolitical circumstances, and weather or climate.

3.3 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

NEPA requires Federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the CEQ regulations 40 CFR §1508.7 as "the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency . . . or person undertakes such other actions." In its guidance, the CEQ has stated that the "cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or airsheds" using the concept of "project impact zone" (i.e., the area that might be influenced by the Proposed Action).

Offering and issuing leases for the five parcels, in itself, would not result in cumulative impacts to any resource. Nevertheless, future development of the leases could be an indirect effect of leasing. The draft EIS for the new RMP for the UFO provides BLM's analysis of cumulative effects of oil and gas development based on the Reasonable Foreseeable Oil and Gas Development (RFD) scenario. That analysis is hereby incorporated by reference into this EA and available at:

https://eplanning.blm.gov/epl-front-office/projects/lup/62103/152878/187146/Uncompahgre_RFD_2012-0216.pdf.

The cumulative impacts analysis in the draft EIS for UFO's new RMP accounted for the potential impacts of development of lease parcels in the Cumulative Effects Analysis Area (CEAA) shown on **Map 1** The cumulative impacts analysis presented in **Table 1** addresses past, present, and reasonably foreseeable future actions and expands upon the analysis in the draft EIS. Temporal and spatial boundaries used in the analysis were developed based on resources of concern and actions that might contribute to an impact.

Table 1. Past, Present, and Reasonably Foreseeable Future Actions (RFFAs) in the Cumulative Effects Analysis Area (CEAA)

Resource	***Projects***	***Past, Present, or RFFA***
Vegetation Management	Forestry. Past, present, and foreseeable forestry uses in the CEAA include personal and commercial harvest of fuel wood, poles and posts for fence building, wildings (live trees and shrubs), and Christmas trees.	Past, Present, RFFA
	Vegetation treatments. Prescribed fire and mechanical treatments of vegetation (e.g., chaining, roller-chopping, harrowing, drill seeding, hydro-axing, and brush mowing) were common in the past on public and private rangelands in the CEAA. With the exception of chaining, these treatments still occur and are likely to continue.	
	Hazardous fuels reduction. Fuels treatments, including prescribed fires, chemical and mechanical treatment, and seeding, are expected to continue and potentially increase in the future.	
Livestock Grazing	In the CEAA, the BLM manages 12 grazing allotments with 7 grazing permittees. Historically, several areas sustained high levels of both sheep and cattle grazing. Seasonal cattle grazing still occurs, to a lesser degree, from approximately June through September. The Forest Service prepared an EA in 2005 for the Muddy Creek basin. National Forest System lands surrounding the project area contain 11 allotments with multiple permittees. This resource is affected primarily by surface disturbance in forage habitat. Existing coalmines, increasing oil and gas development, and planting of crops have resulted in loss of forage, which is a limiting factor for grazing.	Past, Present, RFFA

Resource	***Projects***	***Past, Present, or RFFA***
Road Construction	Road construction has occurred in association with timber harvesting, historic vegetation treatments, energy development, and mining on BLM-administered lands, private lands, State of Colorado lands, and National Forest System lands. The bulk of new road building is occurring for community expansion and energy development. Road construction is expected to continue at the current rate on BLM and National Forest System lands; the future rate is unknown on private and State of Colorado lands.	Past, Present, RFFA
Realty Authorizations	Colorado Department of Transportation ongoing activities on SH 133 include annual snow maintenance and emergency response actions.	Past, Present, RFFA
	Colorado Department of Transportation is working on highway improvement projects on SH 92 from Hotchkiss to Delta; this project is likely to continue for the next several years.	Present
	Several gravel pits have been approved in the past 5 years, mostly within a few miles of the city of Delta and outside the CEAA.	Past, Present
	Residential developments in the area around the communities of Paonia, Hotchkiss, Crawford, and Delta have been growing in population, with many new houses being built. Most of this development has been downvalley from the coalmines in broader portions of the North Fork Valley. This development has increased traffic and demand for maintenance on SH 133.	Past, Present, RFFA
	Natural gas pipelines in the area include the Bull Mountain Gathering line; Ragged Mountain Gathering; Sheep Gas Gathering System; Henderson Lateral pipeline, Aspen Leaf trunk pipeline, Hotchkiss Ranches Gas Gathering System, Vessels Oxbow facility connection line from Borehole 1, and local utility service pipelines	Past, Present
	Sheep-Bull connector natural gas pipeline. Gunnison Energy (GELLC) would convey produced gas from the Sheep Gas Gathering System to the SG Interests (SGI) Bull Mountain Pipeline. It would connect on private land at the existing Sheep pipeline yard traverse National Forest System lands to the NE cross-country but parallel to NFSR 851 and tie into the Bull Mountain Pipeline on National Forest System lands.	RFFA
Recreation	The primary recreational activities in the UFO are motorized vehicle touring, all-terrain vehicle use, motorcycling, mountain biking, big and small game hunting, fishing, hiking, backpacking, horseback riding, sight-seeing, target shooting, dog-walking, and river boating. Recreation-based visitor use in the UFO has increased in most areas in recent years and is expected to continue to increase on BLM lands and National Forest System lands, State Parks, and private lands.	Present, RFFA
	Unauthorized travel. Travel off designated or existing routes and the creation of social trails has occurred and is likely to continue to occur.	Past, Present, RFFA
	Forest Service Special Areas; Roadless Area Conservation; Applicability to the National Forests in Colorado; Final Rule (77 Federal Register 39576-39612, 3 July 2012). The Colorado Roadless Rule provides management direction for conserving and managing approximately 4.2 million acres of Colorado Roadless Areas on National Forest System lands.	Past, Present

<table>
<tr><th>Resource</th><th>Projects</th><th>Past, Present, or RFFA</th></tr>
<tr><td rowspan="6">Coal</td><td>The following table contains recent production data for the three coalmines in the North Fork Valley, within the CEAA.
<table>
<tr><th colspan="5">Raw Coal Production in the North Fork Valley</th></tr>
<tr><td colspan="5">Year Averages (Tons)</td></tr>
<tr><th>Average Based on</th><th>Bowie No. 2 Mine</th><th>Elk Creek Mine</th><th>West Elk Mine</th><th>Total</th></tr>
<tr><td>5 Years</td><td>2,897,076</td><td>2,555,310</td><td>5,806,743</td><td>11,257,129</td></tr>
<tr><td>1 Year</td><td>Closed</td><td>Closed</td><td>5,551,636</td><td>5,551,636</td></tr>
<tr><td colspan="5">Note: 5-year period ends June 30, 2014; 1-year period is August 1, 2016 through July 31, 2017.</td></tr>
</table></td><td>Past, Present</td></tr>
<tr><td>The Elk Creek Mine was a longwall operation north of Somerset, operated by Oxbow Mining, LLC (Oxbow), with a loadout immediately north of Somerset. A total of 13,430 acres are permitted. This operation is closed.</td><td>Past</td></tr>
<tr><td>The West Elk Mine is a longwall operation located south and east of Somerset and is operated by Mountain Coal Company with a loadout about 1 mile east of Somerset. A total of 19,855 acres are permitted.</td><td>Present, RFFA</td></tr>
<tr><td>Bowie No. 2 Mine is a longwall operation located northeast of Paonia, and is operated by Bowie Resources, LLC with a loadout northeast of Paonia. A total of 14,540 acres are permitted in the combined permits of the Bowie No. 1 and No. 2 Mines accessed by the Bowie No. 2 Mine. The mine is currently closed.</td><td>Past, Present</td></tr>
<tr><td>Oxbow has completed exploration drilling to confirm the quality, quantity, and extent of the coal within this area. The Oak Mesa project encompassed about 13,873 acres north of Hotchkiss. The coal exploration license expired under its own terms in September 2014.</td><td>Past</td></tr>
<tr><td>The Forest Service issued a Notice of Intent to prepare a supplemental Environmental Impact Statement to propose reinstatement of the North Fork Coal Mining Area exception of the Colorado Roadless Rule. The North Fork Coal Mining Area exception was reinstated and became effective in April 2017. The exception allows for temporary road construction for coal exploration and/or coal-related surface activities in a 19,100-acre area. Arch Coal plans to expand its underground West Elk Mine.</td><td>RFFA</td></tr>
<tr><td rowspan="2">Oil and Gas</td><td>The BLM routinely offers land parcels for competitive oil and gas leasing to allow exploration and development of oil and gas resources for public sale. Continued leasing is necessary for oil and gas companies to seek new areas for oil and gas production, or to develop previously inaccessible or uneconomical reserves. From 2013 to present, no leases have been issued.</td><td>Past, Present, RFFA</td></tr>
<tr><td>The Cumulative Effects Analysis Area (CEAA, Map (1) includes 265,355 surface acres, of which 227,877 acres (86%) includes Federal fluid mineral estate; the remaining 14% consists of privately owned minerals. See the following table for leased and unleased acres of Federal mineral estate, by surface ownership, in the CEAA.</td><td>Past, Present, RFFA</td></tr>
</table>

<table>
<tr><th>Resource</th><th>Projects</th><th>Past, Present, or RFFA</th></tr>
<tr><td></td><td>The following table summarizes surface ownership and lease status of the 86% of the CEAA that contains Federal fluid minerals.
<table>
<tr><th colspan="3">Federal Fluid Mineral Estate in the CEAA 2018</th></tr>
<tr><th>Category</th><th>Acres (Approx.)</th><th>Percent</th></tr>
<tr><td>Existing Leased</td><td>105,730</td><td>47%</td></tr>
<tr><td>USFS Surface (Leased)</td><td>72,937</td><td>32%</td></tr>
<tr><td>BLM Surface (Leased)</td><td>6,084</td><td>3%</td></tr>
<tr><td>Private Split-Estate (Leased)</td><td>26,709</td><td>12%</td></tr>
<tr><td>Existing Unleased</td><td>122,157</td><td>53%</td></tr>
<tr><td>USFS Surface (Unleased)</td><td>102,063</td><td>45%</td></tr>
<tr><td>BLM Surface (Unleased)</td><td>12,342</td><td>5%</td></tr>
<tr><td>Private Split-Estate (Unleased)</td><td>7,752</td><td>3%</td></tr>
<tr><td>Total Federal Mineral Estate</td><td>227,877</td><td>100%</td></tr>
</table></td><td>Past, Present, RFFA</td></tr>
<tr><td rowspan="6">Oil and Gas</td><td>BLM Uncompahgre Field Office Reasonable Foreseeable Development Scenario for Oil and Gas (UFO 2012 RFD). This document looks at potential oil and gas resources in the UFO planning area over 20 years.</td><td>RFFA</td></tr>
<tr><td>In the CEAA, including all operators and both Federal and Fee minerals, 57 wells are currently producing or are capable of producing, 29 wells have been plugged and abandoned, and 15 Federal APDs are approved but not yet drilled. Of the 57 active wells in the CEAA, 32 are Federal fluid minerals, 23 are private fluid minerals, and 2 are water disposal wells. Of these, 35 wells are within the RFD's Conventional Very High category, anticipating more than 12 wells per township; 20 CBM wells include 5 in the CBM Moderate category, anticipating 20-39 wells per township; and 15 are in the CBM High category, anticipating 40 or more wells per township.</td><td>Past, Present</td></tr>
<tr><td>Vessels Coal Mine Methane Capture Project. Methane Drainage System situated above Oxbow Mining LLC's Elk Creek Mine near Somerset. Capture of low-level coalmine methane emissions produced at the mine as a result of coal extraction, and combusted on site for either electrical generation with excess flared gas rather than venting directly to atmosphere.</td><td>Past, Present</td></tr>
<tr><td>The GELLC Hotchkiss Federal project in Gunnison County authorized approval of 16 wells on nine pads, of which 10 wells on six pads have been drilled. Three APDs are approved pending drilling.</td><td>Past, Present</td></tr>
<tr><td>The GELLC/SGI dual operator proposal for 25 natural gas wells on five pads, approximately 5 miles west of the Bull Mountain Unit, approved December 7, 2015. Development to-date includes one well on the existing pad and one new well on a new pad. Up to 17 gas wells may be drilled within the next 5 years. Seven APDs are approved and awaiting development.</td><td>Past, Present, RFFA</td></tr>
<tr><td>SGI Bull Mountain Master Development Plan: The BMU MDP involves exploration and development of up to 146 wells on 33 pads, and four water disposal wells on Federal mineral leases. Development to-date includes one private surface/private minerals well drilled into an offsite lease, with six</td><td>Present, RFFA</td></tr>
</table>

Resource	*Projects*	*Past, Present, or RFFA*
	additional Federal APDs approved but not drilled. SG also operates and produces 13 private mineral wells in the Unit.	
	Petrox Resources: APDs for **2 wells** are proposed for development in the Federal Somerset Unit, a 6,400-acre project area that largely overlies the Pilot Knob Roadless Area north of Somerset. An MDP for additional wells has been submitted to the Forest Service but is considered incomplete.	RFFA
	SGI Huntsman Unit Proposal: SGI has proposed drilling in the Huntsman Unit, which includes three SGI leases and has submitted on APD.	RFFA
	SGI Deadman Gulch APD: SGI has proposed **1 well** inside the Deadman Gulch Unit adjacent to the Petrox Somerset Federal Unit. The location is within the Pilot Knob Colorado Roadless Area.	RFFA
	SGI permitted the Bull Mountain compressor station on private land NE of the Bull Mountain Unit. Four gas or diesel motors, three compressors, one separator. Intended to provide compression to assist in moving produced gas from the area through the existing Bull Mountain Gathering line.	RFFA
	North Fork Mancos Master Development Plan (NFMMDP): GELLC proposes to drill, complete, and operate up to **35 horizontal wells from three new and two existing well pads** and to construct associated access roads and gathering pipelines over an estimated 4-to-5-year period. The project area includes the four Federal units (Trail Gulch, Sheep Park II, Iron Point, and Deadman Gulch).	RFFA

3.4 ENVIRONMENTAL CONSEQUENCE OF LEASING AND POTENTIAL DEVELOPMENT

The sale of parcels and issuance of oil and gas leases is an administrative action. Potential lease parcels are reviewed under the approved RMP, and stipulations are attached to mitigate any known environmental or resource conflicts that may occur on a proposed lease parcel. On-the-ground impacts would not occur until a lessee or its designated operator applies for and receives approval to undertake surface-disturbing activities.

The BLM cannot reasonably determine at the leasing stage whether, when, and in what manner and intensity a lease would be explored or developed. The uncertainty that exists at the time the BLM offers a lease for sale includes crucial factors that will affect potential impacts, such as well density, geological conditions, development type (vertical, directional, horizontal), hydrocarbon characteristics; equipment to be used during construction, drilling, production, and abandonment operations, and potential regulatory changes over the life of the 10-year primary lease term.

As an illustration of the uncertainty as to whether a lease parcel, if issued, would be developed, GIS data (as of August 2018) indicate that most (81%) of the Federal oil and gas leases in the CEAA shown on **Map 1** do not have active wells within their boundaries (57 active wells on 18 of 92 existing individual leases in the CEAA), an area comprised of seven full townships and portions of nine others, and totaling nearly 13 townships. Thus, substantial uncertainty exists regarding future development. Therefore, discussions of potential direct, indirect, and cumulative impacts presented in the following 16 resource- or use-specific subsections are necessarily confined to qualitative rather than quantitative characterization.

If lands are offered, leased, and a proposal for site-specific lease operations received by the BLM, additional NEPA documentation and technical analysis would be prepared by the BLM. Aside from the applicable protections provided by the lease stipulations (see **Attachment D**), additional mitigation may be applied as COAs at that time to mitigate identified impacts.

3.4.1 Air Quality and Climate Change

Affected Environment

AIR QUALITY

The portion of the North Fork Valley in which the five UFO parcels are located is within the Central Mountains and Western Slope regions for air quality planning (Colorado Department of Public Health and Environment [CDPHE] 2017a). The Central Mountains Region covers 12 counties, including Gunnison County, in the central area of Colorado with the Continental Divide. The Western Slope Region includes nine counties, including Delta County, on the far western border of Colorado. Air quality concerns in these regions are primarily from impacts related to particulate pollution from wood burning and road dust and from impacts related to ranching, agriculture, mining, energy development, and tourism.

Air quality impacts from pollutant emissions are limited by regulations, standards, and implementation plans established under the Clean Air Act (CAA), as administered by the CDPHE Air Pollution Control Division (APCD) under authorization of the U.S. Environmental Protection Agency (USEPA). The APCD is the primary air quality regulatory agency responsible for determining potential impacts once detailed industrial development plans have been made, and those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices. Any APCD air quality preconstruction permitting demonstrations required would be based on site-specific, detailed engineering values, which would be assessed in the permit application review. Any proposed facility that meets the requirements set forth under division permit regulations is subject to the Colorado permitting and compliance processes.

Regulations and standards that limit permissible levels of air emissions and air pollutant concentrations and are relevant to the North Fork area include:

- National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) and Colorado Ambient Air Quality Standards (CAAQS) (5 Code of Colorado Regulations [CCR]-1001-14)
- Hazardous Air Pollutants (HAPs)
- Prevention of Significant Deterioration (PSD) (40 CFR Part 51.166)
- New Source Performance Standards (NSPS) (40 CFR Part 60)
- National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR Part 63)
- Non-Road Engine Tier Standards (40 CFR Part 89)
- Colorado Oil and Gas Permitting Guidance

Air pollutants monitored in the region include the criteria pollutants carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in effective diameter (PM_{10}), particulate matter less than 2.5 microns in effective diameter ($PM_{2.5}$), ozone (O_3), and sulfur dioxide (SO_2), and HAPs benzene and formaldehyde. The most representative monitored regional background concentrations available for criteria pollutants (CDPHE 2016a) indicate that all background concentrations are below the levels of the NAAQS and CAAQS. Federal air quality regulations adopted and enforced by the CDPHE-APCD limit incremental emission increases to specific levels defined by the classification of air quality in an area. The PSD program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined baseline level. Incremental increases in PSD Class I areas are strictly limited, while limits on increases in sensitive Class II areas are less strict.

Under the PSD program, Class I areas and certain sensitive Class II areas are protected by Federal Land Managers through management of Air Quality Related Values (AQRVs) such as visibility, aquatic ecosystems, flora, fauna, and others. Although the project area is classified as PSD Class II, it is within 200 kilometers (km) of ten Class I areas (the Eagles Nest, Flat Tops, La Garita, Maroon Bells – Snowmass, Mount Zirkel, Weminuche, and West Elk wilderness areas, and Arches, Black Canyon of the

Gunnison, and Rocky Mountain National Parks) four sensitive Class II areas (the Raggeds and Uncompahgre wilderness areas and Dinosaur and Colorado National Monuments. Dinosaur National Monument is regulated as a Class I area for SO_2 by the CDPHE. Evaluation of potential impacts to AQRVs is performed during the New Source Review permitting process under the direction of the CDPHE-APCD in consultation with Federal Land Managers.

As part of the Interagency Monitoring of Protected Visual Environments (IMPROVE) program, continuous visibility-related background data have been collected in the following Class I areas: Flat Tops Wilderness, White River National Forest (Maroon Bells-Snowmass Wilderness), and Weminuche Wilderness. The average standard visual range (SVR) at each of the three sites is historically greater than 150 km. In the most recent reported years, the average SVR has increased to greater than 200 km (IMPROVE 2017).

Nine lakes in the Flat Tops, Maroon Bells-Snowmass, Raggeds, and West Elk wilderness areas have been identified as sensitive to potential changes in lake acidity from atmospheric acid deposition of nitrogen (N) and sulfur (S) based on the acid neutralizing capacity (ANC) of the lake. Of the nine acid-sensitive lakes in these four wilderness areas, the U.S. Forest Service considers Upper Ned Wilson (Flat Tops Wilderness) and Deep Creek Lake (Raggeds Wilderness) extremely sensitive to atmospheric deposition because the background ANC values are less than 25 microequivalents per liter (µeq/L). At Gothic, east of the proposed parcels, a National Atmospheric Deposition Program (NADP) National Trends Network (NTN) station monitors wet atmospheric deposition of nitrogen (N) and sulfur (S), and a Clean Air Status and Trends Network (CASTNET) station monitors dry atmospheric deposition of N and S.

Data from the most recent version of BLM Colorado's Annual Report for Air Resources are incorporated by reference in this analysis to provide supplemental information for the affected environment and cumulative impacts analysis. The Annual Report is available on BLM Colorado's website at:

https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado

The following lists locations in the online Annual Report where supplemental information can be found:

- "Criteria Air Pollutants" and "Hazardous Air Pollutants" sub-sections provide baseline air pollutant monitoring concentration data;
- Additional information regarding PSD analyses and AQRVs can be found in the "Airshed Classes and the Prevention of Significant Deterioration" and "Air Quality Related Values" sub-sections.
- Baseline emissions data for counties and areas near the proposed lease parcels can be obtained from the "Emissions Source Classifications and Regulatory Status" section.

CLIMATE CHANGE

Climate change is a statistically significant and long-term change in climate patterns. The terms climate change and "global warming" are often used interchangeably, although they are not the same thing. Climate change is any deviation from the average climate, whether warming or cooling, and can result from both natural and human (anthropogenic) sources. Natural contributors to climate change include fluctuations in solar radiation, volcanic eruptions, and plate tectonics. Global warming refers to the apparent warming of climate observed since the early 20th century and is primarily attributed to human activities, such as fossil fuel combustion, industrial processes, and land use changes.

Current understanding of the climate system comes from the cumulative results of observations, experimental research, theoretical studies, and model simulations. The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) (IPCC 2013) presented findings indicating that warming of the climate system is unequivocal and that many of the observed changes are unprecedented over decades to millennia. An increase in Global Mean Surface Temperature since the late 19th century is described as "certain," while an increase in maximum and minimum temperatures overland since 1950

are described as "virtually certain" (99 to 100% probability). The globally averaged combined land and ocean surface-temperature data show a warming of 1.5 degrees Fahrenheit (°F).

Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea-level rise, and in changes in some climate extremes. The AR5 concluded that it is "extremely likely" (95 to 100% probability) that human influence has been the dominant cause of the observed warming since the mid-20th century (IPCC 2013). The U.S. Global Change Research Program released the third U.S. National Climate Assessment (NCA), which summarizes the current state of knowledge on climate change and its impacts throughout the U.S., including the Southwest region in which the proposed UFO parcels are located (NCA 2014).

All climate model projections indicate future warming in Colorado (BLM 2015). The Statewide average annual temperatures are projected to warm by +2.5 °F to +5 °F by 2050 relative to a 1971 to 2000 baseline under Representative Concentration Pathway (RCP) 4.5. Summer temperatures are projected to warm slightly more than winter temperatures, where the maximums would be similar to the hottest summers that have occurred in the past 100 years. Precipitation projections are less clear. Nearly all of the models predict an increase in winter precipitation by 2050, although most projections of snowpack (April 1 snow-water equivalent measurements) show declines by mid-century due to projected warming. Late-summer flows are projected to decrease as the peak shifts earlier in the season, although the changes in the timing of runoff are more certain than changes in the amount of runoff. In general, the majority of published research indicates a tendency toward future decreases in annual streamflow for all of Colorado's river basins. Increased warming, drought, and insect outbreaks, all caused by or linked to climate change, will continue to increase wildfire risks and impacts to people and ecosystems.

Information from the online Annual Report (https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado) is also incorporated by reference for this section. Baseline greenhouse gas (GHG) and climate change information are in the "Climate Change Baselines" section of the online Annual Report.

Environmental Consequences of Leasing and Potential Future Development

The primary pollutants emitted during potential future development include CO, NO_X, PM_{10}, $PM_{2.5}$, SO_2, volatile organic compounds (VOCs), and HAPs, including benzene, toluene, ethyl benzene, xylenes, n-hexane, and formaldehyde. Major sources include internal combustion engines associated with vehicles, heavy equipment, the drilling rig, generators, and hydraulic fracturing, fugitive dust from disturbed surfaces and unpaved roads, chemicals used during drilling and completions, and any uncaptured or uncombusted hydrocarbons. Well development would temporarily elevate localized pollutant levels.

Emissions during long-term production would occur from vehicular traffic, on-pad equipment such as separators and tank heaters, compressor engines, uncaptured releases from storage tanks, and occasional workovers utilizing small drilling rigs. The primary pollutants emitted during long-term production would be CO, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOCs, and HAPs. These emissions would affect air quality in the project area over the life of any future development. Production equipment is subject to current and future CDPHE Best Available Control Technology (BACT) and Reasonably Achievable Control Technology (RACT) guidance and applicable portions of 40 CFR Part 63 Subparts OOOO and OOOOa, Standards of Performance for Crude Oil and Natural Gas Production.

The magnitude of potential emissions from future oil and gas development on the UFO parcels cannot be estimated at this time due to uncertainties involving the number of oil and gas wells, the size of associated surface disturbance, the exact location of these impact sources, and the timing, intensity, and duration of development and production activities. However, under both FLPMA and the CAA, the BLM requires authorized activities to comply with applicable local, State, Tribal, and Federal laws.

All lease parcels in Colorado are subject to Exhibit CO-56 (**Attachments C and D**) as noted in **Section 2.2.2** (Preferred Alternative). The purpose of Lease Notice CO-56 is to alert bidders/lessees of BLM Colorado's air quality review process and potential restrictions that may be applied to protect air

resources. The BLM uses this process, Colorado's Comprehensive Air Resource Protection Protocol (CARPP), in its air quality analyses as part of its NEPA review of future oil and gas developments. Future site-specific NEPA analysis would include an emissions inventory for each APD and, if applicable, associated proposed surface-disturbing activity.

The necessary data comprise more than 250 items per development proposal, including but not limited to existing road lengths and types, vehicle speeds, soil characteristics, meteorological parameters, elevation, terrain type, vegetation type, development rates and schedule, estimated oil or natural gas production, area and duration of surface disturbance, dust suppression, heavy equipment operation (by development phase and including quantity of each equipment type, horsepower, load factor, duration of use), drill rig specifications, chemistry of produced gas, well completion details (duration, hydraulic fracturing, closed loop, estimated flowback volume, flowback days, gas control method and efficiency), completion engine specifications, separator and tank specifications, pneumatic device details, components details (quantity of valves, pump seals, connectors, flanges), workover details, and on-road details (by development phase and including vehicle type and quantity, frequency of use, fuel type, round trips, average vehicle weight).

Data included in the inventory are used to determine the appropriate form of analysis for potential near-field, far-field, and cumulative air quality impacts. Results of the analyses are included in the NEPA records in order to inform the decision-maker of potential impacts to human health and the environment. Data from all emissions inventories throughout BLM Colorado are consolidated to provide an updated cumulative-effects analysis (Colorado Air Resource Management Modeling Study [CARMMS]) and to update field-office-specific NEPA language and annual reports. GHG emissions estimates generated from the project-specific emissions inventories are also compared to various scales (County, State, and Federal) of such emissions for total oil and gas production. This establishes a frame of reference for the public to analyze potential impacts of each local-scale project at the global scale of climate change.

Cumulative Impacts of Leasing and Potential Future Development

As described earlier in this subsection, the project-specific NEPA analysis for any future oil and gas developments would include project near-field, far-field, and cumulative impacts in comparison to air quality standards in effect at the time of the future development. As described in the introduction to **Section 3.4**, it is impossible to know the timing, scale, locations, or duration of any future oil and gas activities on the currently proposed parcels. Variables affecting future development include market drivers, geological conditions, technological approaches used by various operators for various situations, surface-use restrictions applicable to locations that are preferred for optimizing fluid mineral access, changes in environmental regulations affecting future development, and geopolitical influences.

No standard ratios of wells or well pads per given area exist because of the combination of subsurface geology, surface constraints, and specific technology. However, as shown by data in **Table 1**, the total area of the five proposed UFO parcels equates to 2.7% of the currently leased Federal fluid minerals in the CEAA and 1.1% of the total area. Even with a corresponding increase in total number of wells developed in the CEAA, the BLM would not have information about important factors affecting air quality, including (1) the rate (intensity) at which development occurs, (2) the degree to which development of the five proposed parcels and existing or additional future parcels occurs in proximity to each other; (3) the degree to which development of the five proposed parcels and existing or additional future parcels overlaps in time; (4) continued improvement in emission rates from oil and gas technology and operations; (5) the distribution of development activities in relation to seasonal meteorological conditions; and (6) the ambient air quality at the time of the future development, especially drilling and completions.

To examine potential cumulative air quality impacts from activities that it might authorize, the BLM is using CARMMS 2.0 modeling results in this EA. The study includes assessment of statewide impacts of projected oil and gas development (both Federal and fee, i.e., private) through year 2025 for three development scenarios (low, medium, and high). Projections for development are based on either the

most recent Field Office Reasonably Foreseeable Development (RFD) document (high scenario), or by projecting the current 5-year average development pace forward through 2025 (low scenario). The medium scenario includes the same well count projections as the high scenario, but assumes restricted emissions; the high and low scenarios assume current (Year 2015) development practices and regulations.

Each Field Office was modeled with the source apportionment option, meaning that incremental impacts to regional ozone and AQRVs from development within each field office are parsed to understand better the significance of development in each area on impacted resources and populations. The CARMMS leverages the work completed by the Intermountain West Data Warehouse, and the base model (2011) platform and model performance metrics are based on those products. The complete report and associated data are available on our website at:

https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado

The BLM continually tracks authorized oil and gas activity to determine which CARMMS scenario would be most appropriate to estimate air resource impacts based on the source apportionment area's cumulative Federal development and total production. Although the predicted impacts are based on future modeling results (year 2025), the differences in the impacts between the scenarios provide insight into how mass emissions impact the atmosphere on a relative basis, and are thus useful for making qualitative correlations for the tracked emissions levels.

On a cumulative basis, overall Federal oil and gas in Colorado is tracking close to the CARMMS 2.0 low scenario, with higher than "CARMMS 2.0 low scenario projected new oil and gas development" levels occurring in the DJ Basin of the Royal Gorge Field Office and within the Colorado River Valley Field Office (two typically active oil and gas development areas of Colorado). The cumulative maximum air quality and AQRV impacts described in this EA use the CARMMS 2.0 high scenario modeling results (**Table 2**) and are greater than those expected to occur in the near future based on observations of actual new oil and gas development trends (because no area in Colorado is outpacing the high development scenario, and Colorado statewide is tracking below the CARMMS 2.0 high development scenario).

Table 2. CARMMS 2.0 High Scenario New Federal Emissions (TPY) [1]

Source Area	*PM_{10}*	*$PM_{2.5}$*	*VOC*	*NO_x*	*SO_2*
UFO	113	30	358	464	1
Colorado	6,518	1,543	33,514	23,714	1,231
[1] Year 2025 emissions for new Federal oil and gas development years 2016 through 2025					

Cumulatively, all new Federal oil and gas developed in Colorado through year 2025 for the CARMMS 2.0 high scenario could contribute a maximum 0.0243 kilograms per hectare per year (kg/ha-yr) of nitrogen deposition annually at the nearby Raggeds Wilderness and approximately 0.0216 kg/ha-yr at the Maroon Bells – Snowmass Wilderness. For all sources cumulatively, CARMMS 2.0 predicts 0.34 kg/ha-yr of overall improvement from baseline year 2011 through year 2025 for the high scenario for both Maroon Bells – Snowmass and West Elk Wildernesses. **Table 3** shows the contribution from the UFO.

Table 3. CARMMS 2.0 High Scenario Annual Nitrogen Deposition – UFO

Max Class I (kg/ha-yr)	*Class I Area*	*Max Class II (kg/ha-yr)*	*Class II Area*
0.009	Maroon Bells – Snowmass Wilderness	0.011	Raggeds Wilderness

Cumulatively, all new Federal oil and gas in Colorado for the CARMMS 2.0 high scenario could contribute up to 0.03 dv of visibility change at Maroon Bells – Snowmass Wilderness, as well as at West

Elk Wilderness. Overall, the CARMMS 2.0 high scenario cumulative worst 20% visibility days from all sources in future year 2025 predicted 8.24 dv at both Maroon Bells - Snowmass Wilderness and West Elk Wilderness (an improvement from 8.47 dv measured in 2011). **Table 4** shows the contribution for UFO.

Table 4. CARMMS 2.0 High Scenario Visibility Changes – UFO

Max Class I (dv)	*Class I Area*	*Days > 0.5 dv*	*Days > 1.0 dv*	*Max Class II (dv)*	*Class II Area*	*Days > 0.5 dv*	*Days > 1.0 dv*
0.13	Maroon Bells – Snowmass Wilderness	0	0	0.16	Raggeds Wilderness	0	0

The CARMMS 2.0 maximum predicted year 2025 cumulative ozone concentrations for the areas near the lease parcels and the North Fork Valley are predicted to be below the NAAQS for all three modeled CARMMS 2.0 scenarios. The difference between the CARMMS 2.0 high and low modeled year 2025 ozone maximum cumulative concentrations is less than 1.0 part per billion; new potential Federal oil and gas development associated with three recently assessed project proposals as well as any new potential development that could occur for the lease parcels is not expected to contribute significantly to future year cumulative ozone concentrations.

In summary, the CARMMS 2.0 analysis for existing and reasonably foreseeable development in the area does not predict any significant impacts to visibility, deposition, or ozone. According to the BLM Colorado 2015 Annual Report (2017a), none of the nearby Class I areas is impacted at levels approaching significant analysis thresholds for the reporting year (2015).

Project-Level Assessment and Future Monitoring

Over the past few years, BLM Colorado has completed three project-level air quality impact assessments (Bull Mountain MDP – 146 wells, Dual Operator Project – 25 wells, and North Fork Mancos MDP – 35 wells) for the area of the proposed lease parcels that included AERMOD / CALPUFF modeling to analyze potential criteria and hazardous air pollutants, and AQRV impacts. Air quality modeling for those analyses accounted for existing and future projected emissions inventories for the Region, and the results for those analyses indicated that each project would not significantly impact air quality and the cumulative concentrations for the area would be below applicable thresholds. As a result for the Bull Mountain Unit MDP, the BLM and project proponent track new oil and gas emissions for the Unit to ensure that new oil and gas emissions levels for the project development stay at or below emissions levels analyzed in the EIS and identified in the decision.

In April 2018, BLM Colorado began operation of an air quality monitor at Paonia High School in the North Fork Valley. The monitoring data are used to evaluate the effect of new Federal oil and gas development in the area on air quality in the North Fork Valley, and will also support future impact assessments of oil and gas development proposals in the area. Over the past few months (as of late August 2018), BLM has been collaborating with operators in the area to obtain oil and gas development information for comparison with the North Fork Valley (Paonia) monitoring data. Any new oil and gas development project that could occur on the proposed lease parcels would also undergo similar near-field and far-field modeling. The BLM will continue to monitor air quality for the North Fork Valley as new oil and gas development in the area continues.

Greenhouse Gases

Oil and gas development is expected to remain on the current track (i.e., tracking low relative to the CARMMS low scenario) for the foreseeable future in Colorado. Currently, significant shifts are not foreseeable in petroleum market dynamics (supply, demand, etc.), changes or advancements in development / recovery technologies, newly discovered resources / plays, or political influences (tax or regulatory incentives) that would significantly affect development rates in Colorado. Thus, CARMMS

2.0 is an applicable and appropriate tool for describing impacts for future oil and gas projects within all of the Colorado planning areas.

Continued field development, operation of well site equipment, and associated vehicle traffic would result in minor cumulative contributions to atmospheric GHGs. Natural gas and condensate produced from oil and gas development would be refined to produce a wide range of fuel products for consumer or commercial use. The combustion of these fuels would generate GHGs, which would be controlled through applicable GHG control regulations (emissions standards) or applicable air permit requirements.

Other industrial operations in the area would also contribute to GHG emissions through the use of carbon fuels (liquefied petroleum gas, oil, and diesel), and through use of electricity produced using carbon fuels. Other anthropogenic activities, such as residential wood and open burning, as well as biogenic sources, also contribute GHGs to the atmosphere. These would be more dispersed, but also more sustained, than the emissions from this oil and gas development, which has a finite lifespan.

Policies regulating specific GHG concentration levels and their potential for significance with respect to regional or global impacts have not been established. According to Office of Natural Resources Revenue's (ONRR's) U.S. Department of the Interior data, the country's total Federal (onshore) oil and gas production in 2015 was approximately 191 million barrels (bbl) of oil and 3,482,000 million cubic feet (MMcf) of natural gas, which accounted for 5.6 percent and 10.6 percent of the nation's total production (combined Federal and non-Federal), respectively (ONRR 2017). Similarly, Colorado's Federal oil and gas production represented 0.66 percent and 13.7 percent of the nation's Federal oil and gas production, and 0.15 percent and 2.0 percent of the nation's total (onshore and offshore) production (Federal and non-Federal). For this analysis, the BLM makes the conservative assumption that all of the oil and gas produced in the U.S. is combusted within the larger sectors of the economy (electricity generation, transportation, industry).

The U.S. produced 6,587 MMT of CO_2e emissions in 2015 according to EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks (2017c). The calculated 2015 CO_2e emissions from Federal oil and gas development in Colorado (38.4 MMT) and across the nation (273 MMT onshore and 592 MMT onshore and offshore combined) represent 0.58 percent, 4.1 percent (onshore), and 9.0 percent, respectively, of the nation's total GHG emissions (IPCC 2013, EPA 2014, ONRR 2017).

At a global scale, the U.S. and the world produced 6,344 MMT and 53,530 MMT, respectively, of CO_2e emissions in 2012 (The World Bank Group 2017). In other words, the U.S. produced 12 percent of the global GHG emissions.

In addition, BLM's Greenhouse Gas and Climate Change Report (2017b) is incorporated by reference to describe potential GHG emissions for various future years and energy development scenarios. For that report, GHG emissions were calculated for two energy development scenarios ("normal" and high rates of energy production and consumption) for projected years 2020 and 2030 for each BLM State including Colorado. GHG emissions estimates for Federal and non-Federal energy related production (i.e., upstream and midstream) and consumption (i.e., downstream) were developed for coal, oil, natural gas, and liquefied natural gas (LNG). The report used production and consumption data presented in the Energy Information Administration (EIA) 2016 Annual Energy Outlook to determine growth factors to estimate normal / high inventories. The following summarizes the projected 2020 and 2030 GHG emissions and trends for Colorado Federal resources:

- Colorado Federal emissions due to oil production and end-use consumption are projected to remain almost static from baseline year (2014) to future years (2020 and 2030) with a slight decrease in GHG emissions for both the normal and high scenarios.
- Colorado Federal emissions due to natural gas production and downstream consumption are projected to increase into year 2030 for both the normal and high scenarios from 42.91 million

metric tons of carbon dioxide equivalents (MMT CO_2e) in base year 2014 to 44.55 and 45.03 MMT CO_2e in the 2030 normal and high scenarios, respectively.

- Colorado Federal emissions due to natural gas liquids are projected to decrease from baseline year 2014 to projected year 2030 by approximately 25 to 30% for both scenarios.

Within the BLM emissions profile, the relative mixture of coal, oil, and natural gas is expected to change from baseline year to 2030. Coal reduces and natural gas increases by year 2030. The report also provides a supplemental "Understanding Future Climate Impacts" section and explains that projected changes in climate are driven by the cumulative emissions, not the emissions profile.

When considering the cumulative emissions on a global scale, the sub-national emissions profile (by BLM as a whole, a BLM Field Office, etc.) is one of many emission contributions. Any single contribution on a sub-national scale is dwarfed by the large number of comparable national and sub-national contributors on a global scale. The relative contribution of GHG emissions from production and consumption of Federal minerals will vary depending on contemporaneous changes in other sources of GHG emissions. It is very unlikely that the global cumulative emissions will be strongly influenced by a single contributor (e.g., UFO) at a national or sub-national scale. However, each GHG emissions source contributes, on a relative basis, to global emissions and long-term climate impacts.

Climate change is discussed above in the Affected Environment subsection of this EA. Related sections of the online Annual Report ("Projected Emissions for Analysis," "Projected Climate Impacts," and "The Carbon Budget") are incorporated by reference (BLM 2017a).

Potential Future Mitigation

As noted above, substantial emission-generating activities cannot occur without further BLM analysis and approval of proposals for exploration and development operations. The BLM may approve activities with conditions of approval (COAs), addressing air pollutant emissions, as appropriate. Prior to approving development activities on a leased parcel, the BLM conducts a refined project-level analysis that considers the impacts of the proposal, to the extent reasonably foreseeable. The BLM's analyses typically consider the emissions inventory for the proposal (including GHGs), and estimated emissions from other development on and outside the lease and other nearby emissions sources. Additional analyses (such as air dispersion modeling assessments) may be necessary. All operators must comply with applicable local, State, and Federal air quality laws and regulations, including Colorado's strict emissions control regulations. The BLM may impose specific mitigation measures within its authority as COAs, based on the review of site-specific proposals or new information about the impacts of exploration and development activities in the region.

Based on the project-specific emissions inventory and modeling, future oil and gas projects involving the UFO parcels may be subject to changes in project design and schedule as needed to protect air resources and AQRVs. Examples of changes to the project design and schedule include using equipment with lower emissions rates, limiting the well development rate in a general area (number of drilling rigs and/or completion operations at a given time), adjusting the well development schedule to specific seasons, altering concurrent well development in a general area (e.g., simultaneous well drilling and completion at one location or multiple proximate locations). In general, project proposals incorporate specific design features, such as closed-loop drilling and green completions.

The BLM will continue to require that activities for projects follow best management practices and continue to encourage operators to control GHG emissions using "common sense" and feasible techniques, such as reducing vegetation clearing when not all is needed (offsets CO_2 emissions), reducing truck idling, and double-checking equipment where fugitive emissions could leak (also a State and Federal requirement for oil and gas operations).

3.4.2 Cultural Resources and Native American Religious Concerns

Affected Environment

CULTURAL RESOURCES

Cultural resources are defined as fragile and nonrenewable remains of prehistoric and historic human activity, occupation, or endeavor as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were important to human history. Cultural resources comprise the physical remains themselves, the areas where significant human events occurred even if evidence of the event no longer remains, and the environment surrounding the actual resource.

Significant cultural resources are defined as those listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Significant cultural resources are generally at least 50 years old and meet one or more of the criteria presented in 36 CFR Part 60. The proposed lease parcels are located within the North Fork area, which is designated as a "Low Probability" zone for the presence of cultural resources. A Class I report (on file at BLM UFO) indicates a probability of fewer than one NRHP-eligible site per section. Historic properties in the area are mainly of the later Historic Period of Euro-American settlement. At least eight cultural resource inventories have been conducted in and around the five UFO proposed parcels recommended for inclusion in the December 2018 lease sale. Of the 2,830.55 acres in these parcels, less than 1% has been inventoried, resulting in no historic properties identified or recorded.

Environmental Consequences of Leasing and Potential Future Development

The leasing of Federal mineral rights for potential oil and gas exploration and production is an undertaking under Section 106 of the National Historic Preservation Act (NHPA). While the Lease Sale would not directly affect cultural resources, activities related to lease exploration and development would have the potential to have effects on properties protected under NHPA. Potential impacts would be analyzed under future NEPA upon the receipt of an APD, SF-299 (request for right-of-way), or Sundry Notice. These would typically include potential impacts associated primarily with construction of well pads, access roads, and pipelines due to the extent of surface disturbance accompanying those activities. Complete Class III cultural resource inventories would be required prior to development of a lease. The required project-level cultural surveys are intended to avoid that potential by identifying cultural sites, assessing their eligibility for inclusion on the NRHP, and either avoiding or, alternatively, mitigating (i.e., cataloging, collecting, and curating) the associated resources.

Potential bidders/lessees would be alerted by Exhibit CO-39 (see **Attachments C and D**) of the need on all parcels for cultural resource surveys at the time of any future oil and gas projects. In addition to this lease notice, all parcels would have a UFO stipulation specific to the protection of cultural resources:

- Exhibit CO-39 – This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O.13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in effects that cannot be successfully avoided, minimized, or mitigated. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes.
- UFO-CSU-Cultural Resources –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect eligible or potentially eligible cultural resources.

Despite these protections, indirect impacts from any future oil and gas projects could result from the increase in human presence associated with project workers or from members of the public who may have

improved access into the area along project access roads. These impacts could range from accidental damage from cross-country travel to vandalism and illegal collection or excavation of sites.

An informational letter was sent to the State Historic Preservation Office (SHPO) on July 6, 2018. No response was expected because no direct effects were proposed that would require SHPO concurrence.

Cumulative Impacts of Leasing and Potential Future Development

As described above, the project-specific NEPA analysis for any future oil and gas developments would include cultural resource surveys within and adjacent to any areas proposed for surface-disturbing activities. Any NRHP-eligible or potentially eligible sites would be avoided or fully mitigated (cataloged, collected, and curated). Although it is not possible to predict the location, scale, or intensity of future development, it would be expected that the required surveys and the required protection of significant sites under Federal statutes, BLM policy, and the UFO-CSU-Cultural Resources stipulation would avoid or minimize project-related impacts. Consequently, the contribution of any future project impacts to cumulative impacts would be expected to be minor or negligible.

Potential Future Mitigation

Because some sites may be present but undetectable during pre-project surveys due to soil or vegetation cover, the BLM may apply a COA to any future project requiring that an archaeological monitor is present during surface disturbance in areas with a high potential for additional cultural resources. For all oil and gas projects, a Standard Education/Discovery COA for cultural resources would be attached to the APDs and ROWs. This COA requires that if cultural resources are uncovered during operations, all work in proximity of the resource must cease and the BLM notified immediately. Within 48 hours of the discovery, the State Historic Preservation Officer (SHPO) will be notified of the discovery, and consultation will begin to determine an appropriate mitigation measure. This COA also alerts the project proponent that any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law.

NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment

The North Fork area is historically known as part of the Ute Tribe homelands, and such areas may contain Traditional Cultural Properties, culturally sensitive areas and landscapes, and areas of special concern to the modern-day Ute Tribes. Tribal consultation letters for the proposed lease sale were prepared for Field Manager signature and mailed to Tribal representatives of The Ute Indian Tribe of the Uintah & Ouray Reservation, the Southern Ute Indian Tribe, the Ute Mountain Ute Tribe, and the Navajo Tribe. These tribal representatives were asked to provide any information they may have regarding culturally sensitive areas and landscapes within or near the five parcels.

Environmental Consequences of Leasing and Potential Future Development

Impacts to culturally sensitive areas and landscapes have not been identified for the proposed UFO parcels. However, at the time of any future oil and gas development proposed for one or more of the UFO parcels, the BLM would consult again with the Tribes. Although no specific lease stipulation or COA applies to areas of Native American religious concern, the BLM uses its regulatory authority to work with the involved Tribes and the project proponent to provide protections of specific places or qualities through project location and design. This protection process would be applied for Federal well developments on both public and, to the extent possible, split-estate lands.

Cumulative Impacts of Leasing and Potential Future Development

Any future development of one or more of the UFO parcels would include re-initiation of Tribal consultation to identify any culturally sensitive areas or landscapes to be affected by the development.

Although every effort would be made at the time of project-specific NEPA to avoid diminution of the quality of the places having special significance to the Tribes, any decreased quality would be cumulative to decreases associated with development of other oil and gas leases in the CEAA.

Potential Future Mitigation

At a project-specific level, the BLM works with the Tribes and the proponent to select locations and incorporate design features to avoid or minimize losses or impacts to places of special religious significance. However, this applies only to BLM-administered public lands, because the Tribes do not typically attempt to affect development on private lands.

3.4.3 Geology

Affected Environment

The general area of the UFO parcels lies in the Gunnison Uplift, in Lower Tertiary strata of the Piceance Basin of western Colorado. This basin is defined by the outcropping of the Cretaceous Mesaverde Group, (comprising multiple formations). The Wasatch Formation is the prevalent bedrock geologic unit at the surface, but small areas of Mesaverde outcrop along the southern margin. The Wasatch is a lower Tertiary (Eocene) interbedded and lenticular, tan, yellowish to reddish brown, and reddish-purple clay stone, siltstone, sandstone, and conglomerate. This formation is highly susceptible to landslides, and slide and alluvial deposits represent a variable cover over Wasatch bedrock.

The Wasatch Formation unconformably overlies the Upper Cretaceous Mesaverde Group (i.e., these two formations are separated by erosion that removed intervening strata). The Mesaverde Group is locally about 6,000 feet in maximum thickness, consisting of sandstones and siltstones deposited along or near the shoreline of the retreating Cretaceous inland sea, with fluvial (stream and floodplain) and palustrine (swamp) environments inland of the shoreline. Coals within the Mesaverde Group represent the onshore swamps.

The marine Mancos Shale is the expected target for oil and gas development operations for most of the lease parcels, although coalbed methane associated with the Mesaverde Group may also be a target. The Mancos Shale was deposited on the bed of the shallow Cretaceous sea that covered much of the western interior of the North American continent. The finer (clay) material that dominates the Mancos Shale reflects its location farther from the shoreline where most of the coarser material was deposited.

Quaternary age surficial deposits occurring at the surface throughout the area consist of deeply weathered soils and various colluvial (slope) and alluvial (stream) deposits. Clusters of basalt boulders in some parts of the area may represent erosional remnants of Quaternary age, although the igneous source rocks are older (Tertiary age). Grand Mesa and Battlement Mesa to the northwest have basalt caps, and the nearby Raggeds, Marcelina Mountain, and peaks of the West Elk Range are a series of Tertiary (Oligocene) laccoliths (lens-shaped igneous intrusives) that extend from Mount Sopris to the San Juan Volcanic Area.

GEOLOGIC HAZARDS

Geologic hazards are present in the project area in the form of current and historically unstable slopes, landslides, and debris flows. The State of Colorado has ranked the State Highway 133 corridor as the second most serious landslide area in Colorado, with active landslides throughout the area Rogers (2005). Landslides are typically associated with steep slopes, saturated soil conditions, and bedrock dip slope. The sensitivity of geologic hazards in this region is most often determined by water content of the soil. Water in the pore space of a soil acts as both a lubricating agent and reducer of effective pressure. In general, soil movement is more likely to occur on east- and north-facing slopes due to the regional bedrock dip to the northeast, as well as higher soil moisture. Roadcuts, such as along State Highway 133 west of Paonia Reservoir and on the descent from McClure Pass to the town of Marble, are notable for frequent rockfalls that require regular maintenance work and often delay traffic.

Localized flooding and debris flows along ephemeral or active stream channels due to the combination of steep gradients through portions of the area, rapid runoff from steep and rocky runoff, and the tendency of the region for brief but intense thunderstorms. Flooding related to these storm events can occur when they occur in late spring or early summer during periods of increased runoff related to snowmelt and protracted rainy periods, when a storm stalls over an area for an extended period instead of moving quickly past, or when a channel has become blocked by debris or structures.

Over the last century, subsidence has been noted at the surface directly above some of the historic coalmines in the area. This coalmining occurred throughout at a small scale but included large underground operations in the areas of Bowie and Somerset, including continuing operations at the West Elk Mine. No damage to overlying resources or structures attributable to subsidence of mined areas has been documented. It is possible that episodes of subsidence aggravated or contributed to some landslide movements, but this has not been established.

The project area has very low seismic activity, with only very low magnitude earthquakes likely (U.S. Geological Survey [USGS] 2008). No significant active faults occur in the region (Morgan 2008).

INDUCED SEISMICITY FROM HYDRAULIC FRACTURING AND WASTEWATER DISPOSAL

Oil and gas companies and independent geophysicists have for many decades monitored microseismic activity—defined as a "faint" or "very slight" tremor—during hydraulic fracturing operations to help them optimize well completions and to gather information about fracture dimensions and propagation (Warpinski 2011, Fisher and Warpinski 2012). These data give an indication of the magnitude of seismic activity associated with hydraulic fracturing, dimensions of resultant (induced) fractures in geologic formations, and probability for fractures to extend into nearby aquifers, if present. Microseismic activity created by hydraulic fracturing typically occurs at a Richter magnitude of 1.0 or less (Warpinski et al. 2012). In comparison, a magnitude 3 earthquake is the threshold that can be felt at the ground surface. In 2012, the National Academy of Sciences (NAS) reviewed more than 100,000 oil and gas wells and waste water disposal wells around the world and concluded that "incidences of felt induced microseismicity appear to be very rare," with only one such documented occurrence, at magnitude 3.6 (NAS 2012, Ellsworth 2013).

More recently (2014), earthquakes with magnitudes of 2.1 to 3.0 in Ohio in 2014 have been attributed to hydraulic fracturing using large volumes of water. This apparently occurred in part because the activity was conducted in vertical proximity to highly fractured Precambrian basement bedrock (Skoumal et al. 2015). No significant damage to buildings or infrastructure is known to have resulted from the small number of induced earthquakes attributed to hydraulic fracturing (Abdulaziz 2014). The vast majority of felt earthquakes related to oil and gas development has been associated not with hydraulic fracturing but with high-volume wastewater disposal wells (e.g., Ellsworth 2013, Rubinstein and Mahani 2015, Skoumal et al. 2015, Yeck et al. 2016) in vertical proximity to fractured crystalline bedrock. A cluster of such earthquakes in Oklahoma has included some with magnitudes large enough (e.g., magnitude 5.8) to cause damage to roads and buildings.

The scale of water disposal associated with future development the UFO parcels and the location of any water disposal wells is currently unknown and would be addressed during any future site-specific NEPA. In general, however, volumes disposed in this method with future development of the UFO parcels would be expected to be small in comparison to major disposal programs known to have caused felt seismicity. In addition, the COGCC now regulates disposal well locations, injection depths, injection pressures and rates, and total disposed volumes to reduce the risk of felt seismicity.

Based on the rare instances of felt earthquakes associated directly with hydraulic fracturing, the relatively small volume likely to be disposed in any disposal wells used in future oil and gas projects, and the restrictions imposed by the COGCC, the BLM does not anticipate that development of one or both parcels

near Paonia Reservoir would result in felt seismicity and especially seismicity at a magnitude that would pose a risk to the dam or the reservoir.

Environmental Consequences of Leasing and Potential Future Development

Construction related to oil and gas developments has the potential to create or exacerbate situations of slope stability if not properly sited, designed, and implemented. Construction of access roads and well pads can result in changes to the local topography, including creation of steep slopes and compromising the stability of existing slopes. Operation of heavy equipment during construction may also trigger small-scale landslides or rockslides on naturally unstable slopes. The following stipulations, applied to all lands on all parcels, would greatly reduce the potential for slope failure associated with oil and gas activities:

- UFO-NSO-Steep Slopes Greater than 40% – Prohibits surface occupancy or use and surface-disturbing activities on slopes steeper than 40%.
- UFO-CSU-Steep Slopes 30-39% –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters.

Localized flooding could be caused by oil and gas activities that alter channel alignment or geometry, do not adequately control stormwater runoff from the well pad or access roads, or interfere with stormflow conveyance due to undersized or improperly installed culverts. These potential impacts would be addressed during future NEPA planning required for future oil and gas projects through the application of appropriate COAs (see below).

No impacts are anticipated to result from microseismicity induced by hydraulic fracturing. See **Section 3.4.15** (Water Quality) regarding protection of surface water and groundwater resources in relation to hydraulic fracturing.

Cumulative Impacts of Leasing and Potential Future Development

Any increased slope instability, triggering of historic slumps, landslides, or rockslides by cutting, and localized flooding that may occur despite application of the stipulations for steep slopes and COAs would be cumulative to similar impacts associated with past, present, or reasonably foreseeable oil and gas projects within the CEAA, and to activities associated with coalmining, road construction, and other construction projects. Because 40% of the CEAA is underlain by leased Federal fluid minerals (**Table (1)**, future development of the area is likely and would largely be managed by the BLM and/or Forest Service, with protective stipulations and COAs to be applied to minimize potential impacts related to geologic hazards.

Potential Future Mitigation

In addition to the protections of the lease stipulations, BLM's authority under standard lease terms includes potentially relocating project components by up to 200 meters and requiring detailed engineering design for any components that the BLM determines could cause or be threatened by slope instability, localized flooding, or unsafe conditions. In areas potentially vulnerable to slope failure, the BLM would require participation by a geotechnical engineer as part of the design team in addition to the regularly required civil engineer. This would apply to well pads, roads, and pipelines. Engineering design would also be required for any culverts to ensure adequate sizing and for any stream crossings to ensure adequate conveyance of stormflows. Stormwater controls would also be engineered. If necessary to ensure safe construction and use of a facility, the BLM would require engineered stabilization methods to reduce the likelihood and potential severity of slope failure.

Changes or realignment of stream channels in relation to oil and gas developments require approval by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act, and stormwater management is addressed by the BLM and the State of Colorado (CDPHE). Decisions regarding application of COAs related to geologic hazards, stormwater management, and related issues occur during

NEPA planning for all projects. The BLM would not approve any project component considered to represent a threat to, or elevated risk from, slope instability and other geologic hazards.

3.4.4 Noise

Affected Environment

The area of the UFO parcels is in a rural setting with supporting wildlife use, grazing, farming, and oil and gas development. Existing noise sources include agricultural and oil and gas activities, and both related and unrelated vehicular traffic. Oil and gas pads are currently distributed sparsely throughout the general area. Ambient sound levels in undeveloped rural areas are typically 30 to 40 A-weighted decibels (dBA) (USEPA 1974, Harris 1991). As a basis for comparison, the sound level of a normal conversation between two people standing 5 feet apart is 60 dBA.

Environmental Consequences of Leasing and Potential Future Development

Any future oil and gas activities involving the UFO parcels would increase noise levels near well pads and along access roads. In the short-term, noise levels would increase during construction, well drilling and completions, and major maintenance activities. Drilling, completion, and operation of oil and gas wells and production facilities are required to comply with COGCC's maximum permissible noise levels at a distance of 350 feet from the noise source (**Table (5)**.

Table 5. COGCC Maximum Permissible Noise Levels

Zone	*Noise Level at 350 feet from the Source (dBA)*	
	Daytime (7:00 A.M. to 7:00 P.M.)	***Nighttime (7:00 P.M. to 7:00 A.M.)***
Residential/Agricultural/Rural	55	50
Light Industrial	70	65
Industrial	80	75
Source: COCGG 2014a.		

Short-term increases in noise levels would characterize the gathering pipeline, road, and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991), the typical noise level for construction sites is about 68 dBA (ranging from 63 to 72 dBA) at 350 feet from the source and 59 dBA at 1,000 feet (ranging from 54 to 63 dBA). Future project-related noise levels would be expected to be comparable to these typical values and to active commercial areas as cited by the EPA (1974). These levels, although higher than the COGCC standard for the Residential/Agricultural/Rural zone, would be limited to areas of active construction, drilling, or completion.

Traffic noise would also be elevated during future oil and gas activities. The greatest increase would be along access roads during the drilling and completion phases. Most current operations utilize pipelines instead of haul trucks for moving fresh water, produced water, and liquid condensate, reducing associated noise levels. Based on La Plata County (2002) data, approximately dBA of noise (at a distance of 350 feet) would be occur during the passage of a heavy haul truck. Less noise would be created by smaller vehicles such as pickup trucks and sport utility vehicles. Although the duration of project-related traffic increased noise would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease during the production phase but would remain as background noise near pads and roads. During maintenance and workover operations, noise levels would temporarily increase above routine well production. Use of heavy trucks instead of pipelines to move fluids during production, and periodic passage of heavy water trucks used for dust abatement, would tend to keep long-term levels more elevated. These disturbances would be occasional and only during daytime.

When necessary due to proximity to a residence or topographic conditions that tend to amplify or direct sound toward a residence, the BLM's regulatory authority allows the agency to require noise-abating equipment, structures, or operational adjustments to reduce the impact and comply with the COGCC noise standards. Methods employed in the past have included requiring more effective mufflers on generators and compressor engines; enclosing generators, compressors, and pumps in sound-abating structures; erecting sound-abating walls; and limiting maintenance activities to daylight hours or otherwise adjusting noise-generating maintenance schedules.

Noise impacts would be expected to be less for parcels near State Highway 133, such as the parcels near Paonia Reservoir, because of currently elevated ambient sound levels.

Cumulative Impacts of Leasing and Future Oil and Gas Development

Cumulative noise impacts occur when multiple noise sources are audible to a listener at a given location, and when multiple noise sources are encountered when moving through an area. Both types of cumulative noise impacts may accompany future development of the five UFO parcels. The first type would consist of future project-related noise in combination with noise already occurring, or occurring in the reasonably foreseeable future, and audible at the same location. An example would be a well pad and adjacent access road in combination with a nearby highway or operation of agricultural equipment. The second type would consist of a well pad and adjacent access road at multiple locations not audible at a given place but encountered repeatedly within a larger area through which a person moves, such as during recreational driving, commuting to/from work, etc.

It is impossible to assess either type of cumulative impact cumulatively because future development locations in relation to other noise sources is unknown. For any particular person, the cumulative impact of multiple noise sources would be based not just on noise levels at the source, distance from the source, and possible attenuation due to intervening topography and vegetation, but also on the scale and pattern of that person's movements in relation to other sources.

Potential Future Mitigation

Measures applied by the BLM to reduce noise impacts associated with oil and gas developments begin with locating well pads and new access roads as far from residences as feasible while accommodating access to the fluid minerals. The following lease stipulation would apply to all lands of all parcels:

- UFO-NSO-Occupied Dwellings – No surface occupancy or use is allowed within 305 meters (1,000 feet) of occupied dwellings and building units as defined by the State of Colorado.

Also important in reducing noise impacts is BLM's requirement for adherence to the noise standard set by COGCC for the residential/agricultural/rural zone, even when no residence is present nearby. Examples of COAs applied by the BLM to abate noise impacts include (1) prohibiting engine braking ("jake brakes") by project-related vehicles, (2) requiring more effective mufflers on generators and compressor engines, (3) limiting non-emergency major maintenance to daytime when possible, (4) placing on-pad gas-lift compressors, pumps, or generators in sound-abating structures, and (5) requiring use of "sound walls" on the well pad when other measures prove inadequate.

3.4.5 Paleontological (Fossil) Resources

Affected Environment

The BLM classifies geologic formations based on the likelihood of significant fossil occurrence (usually vertebrate fossils of scientific interest) according to the Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands (BLM 2016a). These classifications, Classes 1-5, determine the procedures to be followed prior to granting a paleontological clearance to proceed with a project. The PFYC assignments for the geologic units were previously determined by the BLM.

Predominant sedimentary (potentially fossil-bearing) bedrock types in the general vicinity of the UFO parcels are the Mesaverde Group or the Wasatch Formation. The Mesaverde Group is considered Class 3, while the Wasatch Formation is considered Class 5. Fossils in these formations consist primarily of plants, invertebrates, and remains of vertebrates, such as teeth, scales, and small bones or bone fragments. Class 3 units have moderate potential for scientifically significant fossils, and fossils tend to vary in content and significance. Although scientifically significant fossils may occur, they tend to be widely scattered. Management of these areas may include surveys prior to disturbance, record searches, or monitoring during construction. Class 5 units have very high potential for scientifically significant fossils. Fossils in Class 5 units are highly susceptible to impacts from surface-disturbing activities, often necessitating surveys prior to disturbance or onsite monitoring during ground-disturbing activities.

The potentially fossil-bearing bedrock strata are mostly covered by extensive soils and vegetation, as well colluvium (unconsolidated material) on slopes and alluvium (water-deposited material) along streams, valley floors, interior basins, and swales. Fossils present in unconsolidated surficial deposits yield incomplete information on their provenance due to their separation from the bedrock formations. However, alluvium may unfossilized remains of vertebrate animals that occurred during the Ice Age.

Environmental Consequences of Leasing and Potential Future Development

Sources of impacts to fossil resources during oil and gas developments include damage or destruction due to construction in unconsolidated surficial materials or contained in shallow or exposed bedrock. Exposures of Wasatch and Mesaverde bedrock are infrequent in the area overall but locally prominent along bluffs, eroded steep slopes, and roadcuts. These exposures are potential sources of fossils that would warrant relocation of proposed activities. The following stipulation on lands for all five parcels is intended to avoid or minimize the risk of loss of scientifically significant paleontological resources:

- UFO-CSU-Paleontological Resources –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect fossils and fossil-bearing bedrock exposures.

Cumulative Impacts of Leasing and Potential Future Development

Any future development of one or more of the UFO parcels would include some loss of surface or near-surface fossils due to being obscured by soil and vegetation cover during surveys. However, the CSU stipulation would minimize this loss. Any fossil losses from oil and gas activities would be cumulative to similar losses associated with past, present, or other future losses on other Federal leases, as well as development of private leases, in the CEAA area. Although 40% of the CEAA currently has Federal fluid mineral leases, BLM or USFS management of these projects is likely to avoid or minimize impacts to fossil resources. In addition, although the location, scale, and intensity of any future oil and gas projects cannot be predicted due to a variety of uncertainties, BLM's experience with oil and gas development in the CEAA indicates that surface-disturbing activities occur across a small percentage of leases, and that construction through bedrock is avoided where possible. Consequently, cumulative impacts on fossil resources are expected to be minor.

Potential Future Mitigation

The CSU developed from the analysis in the Draft RMP/EIS includes the ability to require paleontological surveys where potentially fossil-bearing formations are exposed or occur in the shallow subsurface, and to require relocation of project components during NEPA planning of any future projects. An additional measure that would be applied as a COA when applicable is to require that any scientifically significant fossils that are discovered during surveys or monitoring of construction and that would be vulnerable to future damage or loss are properly salvaged and curated for scientific study.

3.4.6 Ranching and Livestock Management

Affected Environment

Ranching activities, including hay production and livestock grazing, are widespread in both irrigated and non-irrigated settings through the area encompassing the UFO parcels. While hay production does not occur on BLM-administered public land, it is a common on private land in areas of adequate moisture, the ability to deliver moisture through irrigation if necessary, and the availability of flat terrain and suitable soils. Grazing of livestock on BLM lands is one of the multiple uses available where vegetation and topography are appropriate, access is adequate, and this use is not precluded by conflicts with other resources or uses. Grazing and fluid minerals development are compatible in most situations.

Within the broad area encompassing the UFO parcels (see **Map (1)**, the BLM manages 12 grazing allotments with seven grazing permittees. Historically, several areas sustained high levels of both sheep and cattle grazing. Seasonal cattle grazing still occurs, although at a lower level than previously, from approximately June through September. National Forest System lands shown on **Map 1** include 11 grazing allotments with multiple permittees.

Environmental Consequences of Leasing and Potential Future Development

Future oil and gas activities on the proposed parcels, all of which would require subsequent NEPA analysis and documentation, would affect grazing and livestock management on BLM lands from surface-disturbing activities and other forage loss associated with construction of well pads, new or expanded access roads, buried pipelines, and potentially other surface facilities. It is not possible to predict the amount of surface disturbance, because the number of well pads needed to the future lessees drilling plan is unknown, as are pad size and length of access roads and pipelines, and location in relation to different allotments. In general, the amount of vegetation loss represents a small percentage of the total area of a lease. A portion of this loss, mostly limited to the driving surface of roads and working area of pads (reduced at interim reclamation when drilling and completions are finished), extends through the life of a project. The remainder of the vegetation loss is temporary in connection with areas disturbed by road, pad, or pipeline construction and then promptly reclaimed. Some additional short-term decrease in forage occurs while the temporarily disturbed areas are recovering following revegetation. Up to 5 years may be required before these areas can support the same amount of grazing use as pre-disturbance.

Deposition of fugitive dust on vegetation along unpaved roads can make the vegetation unsuitable for livestock if not adequately controlled. New or increased presence of invasive non-native plants (weeds), particularly along roads, pipelines, and around pads, can also reduce total available forage, since most weeds have low palatability to grazers. For well pads, roads, and pipelines placed on private lands, potential project impacts are somewhat greater, depending on the grazing intensity allowed by the individual landowner. Location of facilities is controlled primarily by the Surface Use Agreement between the operator and the landowner/rancher, and any lost value of hay production or livestock numbers would be offset by the operator, either directly or indirectly.

Other potential impacts include damage to range improvements (cattleguards, stockponds, fences), especially during road and pipeline construction, and temporary or long-term changes in stock movement routes (driveways) due to pads and other facilities. Use by livestock is not affected by activities on well pads, increased traffic, or noise. Injuries or mortalities from vehicles are typically negligible.

Cumulative Impacts of Leasing and Potential Development

Any forage loss from future oil and gas development of the UFO parcels would generally be minor and not affect the number of AUMs (animal units months) of grazing available on a BLM-administered allotment, as these allotments are very large in relation to the amount of direct or indirect forage loss. For allotments that might also include other past, present, or reasonably foreseeable future oil and gas activities, or other activities reducing forage production, the combination of impacts would be greater but

again unlikely to affect numbers of AUMs. This is particularly true under current BLM grazing practices, which utilize less intensive and shorter duration of grazing, placing less stress on the vegetation. Because a high percentage of the CEAA consists of lands managed by the BLM or USFS (**Table (1)**, cumulative impacts on grazing operations would be expected to be minor.

Potential Future Mitigation

Lost forage cannot be replaced during the project life, except for gradual recovery of temporarily disturbed areas extended across a period of 5 years or more. A standard COA for oil and gas projects requires prompt and effective revegetation of temporarily disturbed areas. This includes an emphasis on palatable native grass species, often with forbs and shrubs to better blend with natural conditions and uses, with the goal of controlling erosion and weeds. Another COA requires monitoring of revegetation success and the effectiveness of weed control is required for every project. At the end of the project, approval by the BLM of a Final Abandonment Notice (FAN) is required as a condition of releasing the operator from further responsibility for the condition of the pad, including an evaluation of whether the pad has been fully revegetated and is acceptably free of weeds.

An additional standard COA requires that the operator promptly repair, replace, or compensate the landowner (private lands) or grazing permittee (BLM lands) for any damage to range improvements, or for any injuries or mortality of livestock (both being infrequent). If the damage consists of loss or decreased capacity of a stock-watering facility, the operator is responsible for replacing the lost capacity.

3.4.7 Recreation

Affected Environment

Access to the proposed UFO parcels is expected to be primarily by State Highway 133 (paved) and then by unpaved County, National Forest, and (with permission) private roads. These roads currently provide access to hiking, mountain biking, dispersed camping, recreational on-road and off-road travel, cross-country skiing, snowshoeing, snowmobiling, and the primary recreational use, hunting. Recreational use is generally lighter in spring, which throughout the region is a transition season in which neither winter nor summer opportunities exist for most users. Spring weather is often wet and windy and still cold, and the unpaved roads and recreational trails are muddy or partially blocked by lingering snow.

In addition to dispersed recreational pursuits, Paonia State Park, operated by Colorado Parks and Wildlife in combination with the Bureau of Reclamation (BOR), provides a focal point for more intensive recreational use, primarily in summer and early fall. Although camping and picnicking opportunities exist in the park, most activities are water-centered, with Paonia Reservoir providing for waterskiing, jet-skiing, general boating, and fishing.

The general area of the parcels is within CPW Game Management Unit (GMU) 521. Mule deer, elk, pronghorn, moose, black bear, and mountain lion are hunted within GMU 521. Moose also occur but in small numbers. No habitat for pronghorn is present in the area. Hunting for big game typically includes motorized access into and through the general area to a point used to set up camp. Other hunting in the area is for wild turkeys and, at higher elevations, dusky grouse.

National Forest System Trail 802, the Terror Trail, is located off NFSR 704 and provides recreationists with opportunities to explore the Electric Mountain area, including motorized and non-motorized travel.

Developed recreation facilities such as campgrounds or other developed recreation facilities occur in the area except Paonia State Park and a Forest Service campground adjacent to State Highway 133 near the top of McClure Pass.

Environmental Consequences of Leasing and Potential Future Development

Direct impacts to recreation opportunities, experiences, and setting characteristics from future oil and gas development would result from increased vehicle traffic on area roads, occasional road closures, and

increased noise and human presence associated with construction, drilling, and production. These impacts would diminish scenic qualities, decrease naturalness, and limit opportunities for solitude. Dispersed recreation uses such as biking, hunting, camping, and wildlife viewing, where relative quiet and separation from other human activity is sought as essential to the experience, would also be affected.

Displacement of game species due to construction and drilling would alter hunting opportunities, primarily by reducing wildlife use in areas where the activities are occurring. It is likely that as development continues, the areas of reduced use would shift from year to year, requiring advance planning by hunters to identify where to go and not go to seek game. These disruptions, and periodic brief road closures during drilling rig moves, would decline as development of an area moves into production, with much less activity, traffic, and noise. The presence of operational well pads might dissuade some hunters from using the area due to the industrial appearance, while others might be indifferent to this aspect. Use by wildlife of areas near well pads and roads generally rebounds somewhat during production, as the frequency and intensity of human activity decreases.

It is not possible to predict what impact oil and gas activities would have on big game populations. The relatively low density of most developments on BLM lands in the area, and the area's undulating or broken terrain, with wooded habitats for screening, generally high quality browse and forage, and ample water sources, may limit population impacts. Existing exposure to human activity from ranching activities, rural residential use, and passive recreation may also reduce impacts compared to the first introduction of oil and gas into an area. See **Section 3.4.16** regarding stipulations and COAs related to reducing impacts to big game and their critical winter habitats.

Impacts to the more developed recreational uses of Paonia Reservoir would be expected to be low due to the focused human activity on and around the lake, vehicular travel on State Highway 133, and the noise associated with boating create a different local environment. Oil and gas facilities associated with possible future development projects on Parcels 8320 and 8351 are not expected to be visible from the reservoir. In addition, although no portions of the parcels are on Paonia State Park lands, it is conceivable that a future lessee/operator might wish to cross the park to access one or more of the lease aliquots. This would require permission from CPW.

Cumulative Impacts of Leasing and Potential Future Development

Impacts to recreational users of the BLM-administered public lands and split-estate private lands from future oil and gas activities related to the UFO parcels would be cumulative to similar impacts on other landscape and terrains in the CEAA. Aspects of oil and gas developments that result in permanent changes to an area, including more roads, the addition of an industrial component not currently supporting such use, and to a lesser degree the change in vegetation along pipelines would be cumulative to these increasing changes over the long term. This would gradually level out as the oil and gas potential of the area declines. In contrast, cumulative impacts associated with construction and drilling/completions may be lower if development activities shift through the five parcels and the remainder of the CEAA instead of occurring simultaneously in numerous locations. How this proceeds would be based largely on energy demands and commodity prices, and on the number of different lessees/operators.

Potential Future Mitigation

Mitigation of impacts to recreation mostly involves measures to reduce user conflicts. These include requiring that oil and gas lessees/operators inform local communities erect information signage at key access points to provide notice of significant road closures and, when needed, alternative access past the closure. In some cases, traffic control may be required as a way to minimize disruption. Noise restrictions applied by the BLM (see **Section 3.4.4**) in combination with restrictions on nighttime lighting, and requirements for regular road maintenance, prompt road repair, and ongoing dust abatement would also reduce impacts to recreational users.

3.4.8 Socioeconomics

Affected Environment

The proposed parcels for the December 2018 lease sale are located in rural areas of Delta County (1,137.74 acres) and Gunnison County (1,692.81 acres). Nearby communities would include Bowie in Delta County and Somerset in Gunnison County. Between 2010 and 2016, the population in Delta County decreased by 1% ending with a population of 30,471 residents in 2016 (Colorado Department of Local Affairs – [CDOLA] 2017a). The population in Gunnison County increased by 7% during this same period ending with 16,394 residents in 2016 (CDOLA 2017a). CDOLA forecasts that Delta County will grow to a population of 35,763 residents by 2035 and Gunnison County to a population of 20,277 residents (CDOLA 2017b).

Since 2010, total employment in Delta County increased by 1% with a total of 15,135 jobs in 2016 (Bureau of Economic Analysis (BEA) 2017a) and saw a decrease in the unemployment rate going from 10.7% in 2010 to 4.9% in 2016 (Bureau of Labor Statistics (BLS) 2018). In 2016, the three industries with the greatest number of jobs in Delta County was government (16% of total employment), retail trade (12% of total employment), and health care and social assistance (11% of total employment) (BEA 2017a). Farming employment was 9% of total employment while mining was 2% of total employment in 2016 in Delta County (BEA 2017a). Delta County had a 46% reduction in mining related jobs from 2010 to 2016 (BEA 2017a) driven by coalmine closures. Gunnison County saw a 7% increase in jobs during the period ending with 13,014 jobs in 2016 (BEA 2017a) and a decrease in the unemployment rate going from 6.4% in 2010 to 2.3% in 2016 (BLS 2018). The three industries in 2016 with the greatest number of jobs in Gunnison County were government (17% of total employment), accommodation and food services (13% of total employment), and retail trade (10% of total employment) (BEA 2017a). Farm employment was 2% of total employment in 2016 in Gunnison County and mining related jobs were not disclosed (BEA 2017a).

Tourism and outdoor recreation contribute to the economies of Gunnison and Delta counties. In Gunnison County, skiing, mountain biking, camping, and hiking are popular in Crested Butte and the Gunnison Valley, and hunting is popular in the West Elk Mountains, a small portion of which are located in Delta County. In both counties, the West Elk Loop Scenic and Historic Byway links the historic mining communities of Redstone, Marble, and Crested Butte with orchards and farms near Paonia and Hotchkiss and the Black Canyon of the Gunnison National Park to the south in Montrose County.

In 2016, visitors spent approximately $36 million in Delta County and $196 million in Gunnison County. In 2016, the travel industry, which is represented primarily by businesses in the leisure and hospitality sector, transportation, and retail, supported an estimated 618 jobs in Delta County and 2,334 jobs in Gunnison County (Dean Runyan Associates 2018).

Per capita income increased from 2010 to 2016 in both counties resulting in Delta County having a per capita income of $32,318 in 2016 (up from $27,873 in 2010) and Gunnison County having a per capita income of $43,473 (up from $33,162 in 2010) (BEA 20017b). Income is derived from two major sources: (1) labor earnings or income from the workplace; and (2) non-labor income including dividends, interest, and rent and transfer payments (payments from governments to individuals; age-related, including Medicare, disability insurance payments, and retirements). In 2016, labor income is the main source of income in both counties—labor income was 46% in Delta County and 57% in Gunnison County (BEA 2017b). In Delta County in 2016, 24% of income came from dividends, interest, and rent and 29% from personal transfer payments (BEA 2017b). A considerable portion of income in Gunnison County in 2016 was from dividends, interest, and rent (32%) with personal transfer payments contributing the remaining 12% (BEA 2017b).

Agriculture is a traditional use of lands in the two counties and continues to be important today. There were 1,494 farms totaling 441,004 acres in the two-county region in 2012 (USDA NASS 2014). The

North Fork Valley has become known for its rural character and organic farms; approximately 40 farms in Delta County were certified organic or transitioning to organic in 2012; Delta County has the largest concentration of organic farms and orchards of any Colorado County (USDA NASS 2014). The area has become a premier agritourism destination in the Rocky Mountains for visitors to organic farms and vineyards; based on the 2012 agricultural census, approximately 21 farms had established agritourism opportunities in Delta County, generating $293,000, and 17 farms in Gunnison County generated $243,000 through agritourism (USDA NASS 2014). Livestock grazing of cattle and sheep is also a traditional use on public and private lands in the area.

The planning area and surrounding North Fork Valley region consist of a largely rural setting with small towns. Meetings were held with local community leaders in advance of preparing a new RMP, which included collected information about local residents' values and desired conditions for community in the planning area. In meetings held for a Community Assessment in November-December of 2008 and in economic workshops in March of 2010, local residents sited small community feeling, slower pace of life, and outdoor lifestyle as important factors in local communities, particularly in Hotchkiss and Paonia. Local community leaders also stressed the importance of health lands and environment as well as municipal watershed protection as important factors. Some representatives, particularly from Delta County, also recognized the importance of mining jobs for the local economy. All communities desired moderate controlled growth (BLM 2009 and BLM 2010). Both use and non-use non-market values of open space can play a role in attracting new residents who in turn bring new sources of income to the area. Communities adjacent to public lands offer a high level of natural amenities that often attract retirees and others with non-labor sources of income, as well as sole proprietors and telecommuters who bring income from other regions into the local economy (Haefele et al. 2007). Undeveloped open space may also influence property value of local homes (Fausold and Lilieholm 1996, Western Governors' Association 1998, and Crompton 2000).

Natural gas production in Gunnison and Delta counties has generally increased over the past several years. Production in the North Fork Valley has centered on natural gas, with relatively little oil. Most production has occurred in Gunnison County, where natural gas production increased from 2,078 MMcf in 2010 to 4,915 million cubic feet (MMcf) in 2016. Oil production in Gunnison County increased from 1,179 barrels in 2010 to 1,608 barrels in 2014 and decreased to 757 barrels in 2016. In Delta County, natural gas production increased from 9 MMcf in 2010 to 1,431 MMcf in 2015 and decreased to 91 MMcf in 2016. Oil production in Delta County increased from 42 barrels in 2010 to 3,044 barrels in 2013 and fell to 5 barrels in 2016 (COGCC 2018).

In the North Fork area, most oil and gas wells on privately owned lands are located on remote ranch parcels. Producing wells on completed well pads typically do not interfere with the productive capability of agricultural land, and have little or no effect on the land's value (Griffith 2017).

Leasing mineral rights for the development of Federal minerals generates public revenue through the bonus bids paid at lease auctions and annual rents collected on leased parcels not held by production. Nominated parcels approved for leasing are offered by the BLM at a minimum rate of $2.00 per acre at the lease sale. These sales are competitive and parcels with high potential for oil and gas production often command bonus bids in excess of the minimum bid. In addition to bonus bids, lessees are required to pay rent annually until production begins on the leased parcel, or until the lease expires. These rent payments are equal to $1.50 an acre for the first five years and $2.00 an acre for the second five years of the lease.

The State of Colorado receives 49% of the total revenue associated with Federal mineral leases. Federal mineral lease revenue for the State of Colorado is divided as follows: 48.3% of all mineral lease rent and royalty receipts are sent to the State Education Fund (to fund K-12 education); 10% of all mineral lease rent and royalty receipts are sent to the Colorado Water Conservation Board; approximately 2% of all mineral lease rent and royalty receipts are distributed directly to local school districts originating the revenue or providing residence to energy employees and their children; and 40% of all mineral lease rent

and royalty receipts are sent to the Colorado Department of Local Affairs, which then distributes half of the total amount received to a grant program, designed to provide assistance with offsetting community impacts due to mining, and the remaining half directly to the counties and municipalities originating the Federal mineral lease revenue or providing residence to energy employees.

Bonus payments are allocated separately from rents and royalties in the following manner: 50% of all mineral lease bonus payments are allocated to two separate higher education trust funds, the "Revenues Fund" and the "Maintenance and Reserve Fund." The Revenues Fund receives the first $50 million of bonus payments to pay debt service on outstanding higher education certificates of participation. The Maintenance and Reserve Fund receives 50% of any bonus payment allocations greater than $50 million. These funds are designated for controlled maintenance on higher education facilities and other purposes. The remaining 50% of mineral lease bonus payments are allocated to the Local Government Permanent Fund, which is designed to accumulate excess funds in trust for distribution in years during which Federal mineral lease revenues decline by 10% or more from the preceding year.

During the lease period, annual lease rents continue until one or more wells are drilled that result in production and associated royalties. The Federal oil and gas royalties on production from public domain minerals equal 12.5% of the value of production (43 CFR 3103.3.1).

Past research on social impacts associated with energy development shows that social well-being often decreased during a boom, but then tended to increase once the boom is over. A comparative and longitudinal study conducted in Delta, Vernal, and Tremonton, Utah, and Evanston, Wyoming, addressed issues of social well-being in boomtowns (Brown et al. 2005; Brown et al. 1989; Greider et al. 1991; Hunter et al. 2002; Smith et al. 2001). With the exception of Tremonton, each of these communities experienced a boom during the late 1970s and early 1980s. Delta's boom resulted after the construction of a power plant while the booms in Evanston and Vernal were primarily related to oil and gas development. At least four surveys were conducted in these communities from 1975 to 1995. Several indicators of social well-being were examined, including perceived social integration, relationships with neighbors, trust of community residents and community satisfaction. Delta and Evanston showed similar patterns associated with these indicators. During the peak boom years, residents experienced diminished perceived social integration, relationships with neighbors, trust of residents, and community satisfaction. Interestingly, Brown and others (2005) pointed out that the greatest declines in community satisfaction in Delta occurred just before the largest population increase of the 20-year study period, indicating that changes in population cannot alone account for shifts in community satisfaction and social integration. Nonetheless, by 1995, the levels of these indicators had returned to or exceeded pre-boom levels.

Another 2011 study highlights several of the changes that have been seen across the Bakken oil counties and the impacts to quality of life (Bohnenkamp et al. 2011). For example, the study highlights that the familiarity of residents with other residents and the safety often felt in small rural communities has shifted to in-migration of new people and safety concerns resulting from not knowing these people. The study also highlights concerns over housing prices and values increasing and the 38 changing of the population. While there is an in-migration of people for oil field jobs, there has also been an out-migration of long-time residents due to not being able to afford the rising housing costs (Bohnenkamp et al. 2011).

The proximity of oil and gas wells and related facilities can influence nearby residential property sales, especially those on split estate land. Landowners who do not own mineral rights may be subject to Federal mineral development on their land. Usually, these landowners enter into a surface use agreement and receive compensation, i.e., income, for the use of their land. Estimates of how individual properties are affected by nearby oil and gas development vary from case to case depending on specific location and the exact character and features of a property.

Several studies published in the past several years have attempted to estimate how property values are impacted by nearby oil or gas exploration, drilling, and production. See Krupnick and Echarte (2017) for a summary of recent studies. In general, these studies find that, at the time of sale, the presence of oil and

gas wells near the property reduces the property value relative to what it would have sold for without a nearby well. Unfortunately, the explicit and implicit assumptions used in these estimates (such as the maximum distance for a "nearby well" vary a great deal from study to study, as does the size of the price impacts, which range from zero to negative 37%.

Who owns the minerals appears to be another factor in property values. Split estates are referenced as a possible source of property value differences is several studies and in one (Boslett et al. 2016) property value estimates tended to be significantly lower in a Colorado region where the minerals were owned by the Federal government compared to other areas where a comparable property was located above a non-Federal mineral estate.

Additionally, multiple past studies identify concerns about possible environmental impacts associated with oil and gas exploration and development as one reason for property value differences. However, these concerns (and their influence on prices) can be tempered. Roddewig et al. (2014) state that "[past] real estate market studies indicate that investigation and remediation can limit price and value impacts from oil and gas contamination." Note that the BLM actively investigates and seeks remediation for oil and gas contamination resulting from production on Federal land or into Federal mineral reserves.

Current research also does not provide much guidance on how long these price impacts persist. In a study in Weld County, Colorado, Bennett and Loomis (2015) estimated a 1% decrease in urban house prices for every well being drilled within 0.5 mile "during the time the buyer is deciding upon buying the house (o)nce the well moves out of active drilling and into becoming a producing well, all our models show there is no statistically significant negative effect on house prices."

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, states "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionate impacts on human health or the environment of its programs, policies, and activities on minority populations and low-income populations…." A review of U.S. Census Bureau 2016 population estimates for race and Hispanic origin (U.S. Census Bureau 2017a), indicates that neither Delta nor Gunnison County meet the criteria of having minority populations that are 5 points greater than for the State of Colorado. Similarly, U.S. Census Bureau Small Area Income and Poverty 2016 estimates indicate that the percentage of the population (all ages) in poverty in Delta County was 5 points higher than for the State of Colorado (U.S. Census Bureau 2017b). This indicates that Delta County has low-income populations that can be considered as environmental justice populations.

Environmental Consequences of Leasing and Potential Future Development

The direct effect of leasing and development would be the payments received from leasing all or a subset of the 7,903.04 acres of Federal mineral estate. Indirect effects that might result, should exploration or development of the leases occur, could include increased employment opportunities related to the oil and gas and service support industry in the region as well as the economic contributions to Federal, State, and County governments related to lease payments, royalty payments, severance taxes, and property taxes. Other effects could include the potential for an increase in transportation, roads, and noise disturbance associated with development, and potential for change in property values due to development. These effects would apply to all public land users in the study area, and surface owners above and adjacent to the proposed lease parcels.

Due to energy market volatility and the dynamics of the oil and gas industry, it is not feasible to predict the exact effects of this action, as there are no guarantees that the leases will receive bids, and that any leased parcels will be explored or that exploration will result in discovery of viable fluid mineral production. The types, magnitude, and duration of potential impacts cannot be precisely quantified at this time, and would vary according to many factors. Therefore, any parcel where future drilling activity would take place would first require an APD and requisite NEPA analysis, in which site-specific issues

would be examined. These would include any identified socioeconomic issues resulting from disturbance and drilling on the leased parcel.

Although oil and gas development already occurs in Delta and Gunnison counties, additional leasing and subsequent development could continue the stress on community services and impact people living near a lease or using a nearby area. Oil and gas exploration, drilling, or production, would potentially inconvenience these people through increased traffic and traffic delays, noise, and visual impacts. These impacts would be particularly noticeable in rural areas in which oil and gas development has not occurred previously. The level of inconvenience would depend on the activity affected, traffic patterns within the area, noise levels, the length of time and season in which these activities occurred, and other factors. Other concerns with additional development and production is the creation of new access roads, potentially allowing increased public access, and exposure of private property to vandalism.

Increased oil and gas development can also increase funding availability for school districts and county infrastructure needs such as road improvements and maintenance and provide job opportunities. Historically, tourism and farm-based agritourism have developed concurrently with mineral extraction in the North Fork Valley, and there is no evidence that existing oil and gas development has affected agriculture or tourism in Delta, Gunnison, or other nearby counties. Based on the relatively small size of the parcels compared to current leases, the protective stipulations and site-specific mitigation measures to be applied to retain resource and resource-use values, and additional revenues, the BLM does not anticipate that the lease sale would affect tourism, agriculture, land values, or the county governments.

Because no surface-disturbing activities are associated with a lease sale, impacts from the sale would not have disproportionate impacts environmental justice populations. As previously noted, any parcel where future drilling activity would take place would first require additional NEPA analysis in which site specific impacts including environmental justice issues will be examined. Please also refer to **Section 3.4.2** (Cultural Resources and Native American Religious Concerns) for the discussion of potential impacts associated with leasing and development. The BLM has considered all input from persons or groups regardless of age, income status, race, or other social or economic characteristics. The outreach and public involvement activities taken by the UFO for this effort are described in **Section 1.5.1** (Public Scoping), and **Section 4** (Consultation and Coordination).

Cumulative Impacts of Leasing and Potential Future Development

Any possible future development of fluid mineral resources resulting from this lease sale would be in addition to the current level of development and would include the same types of socioeconomic impacts. To the extent that future, existing, or other reasonably foreseeable projects would overlap in time, or geographically (e.g., by county), cumulative impacts would be greater than for sequential projects for which short-term impacts have declined before the next project's short-term impacts have begun. Long-term cumulative impacts associated with the production phase of concurrent or sequential projects would be less than overlapping short-term impacts associated with the intensive activities associated with construction, drilling, and complete.

Potential Future Mitigation

The direct, indirect, and cumulative socioeconomic impacts of oil and gas developments are a necessary consequence of the activity and cannot be mitigated. However, impacts to individual resources and resource uses that contribute to aspects of the socioeconomic environment are addressed by lease stipulations and COAs. These are described in other discussions in Section 3.4.

3.4.9 Soils

Affected Environment

Soils in the area encompassing the UFO parcels are mostly derived from sedimentary bedrock parent material, although primarily formed indirectly on unconsolidated materials weathered or eroded from the

bedrock. These materials include colluvium on slopes and alluvium deposited by water on valley floors in swales and basins. Where rock outcrops are generally deep, soils are predominantly well-drained loams, clay loams, and stony loams with high to very high runoff potentials. Most of these soils have very limited or poor suitability for native-surface roads because of their low soil strength, excess fines, and high shrink-swell potential. Erosion potential is moderate to high, depending primarily on slope. Hydric soils, with physical characteristics indicating saturation or inundation for substantial portions of the year, occur along slow-flowing drainages, in overbank areas, and at seeps or springs.

Any future site-specific NEPA analysis for oil and gas development would include a compilation of existing soils information available from the Natural Resources Conservation Service (NRCS), with particular attention to any fragile, saline, or highly erosive soils that should be avoided or would require special attention during design, implementation, and reclamation.

Soil erosion occurs in the area encompassing the UFO parcels in association with historically or currently unstable slopes that have led to slumps, landslides, rockslides, and debris flows. These situations are associated with steep slopes accompanying the undulating or deeply dissected terrain and steeply dipping bedrock or fractured bedrock. The triggering condition for slope instability in this region is most often determined by water content of the soil or underlying unconsolidated materials. Water in the pore space of a soil acts as both lubricating agent and reducer of effective pressure. In general, soil movement is more likely to occur on east and north facing slopes due to the regional bedrock dip to the northeast.

Other sources of soil erosion include reduced vegetation cover from surface disturbances, cross-country travel by motorized vehicles ranging from ATVs to 4WD trucks to construction equipment, and potentially by grazing of livestock if not managed properly. Soil erosion is most problematic on sloping terrain such as found in much of the area. Soil erosion can also occur suddenly through the erosive force of runoff from major rainfall events, both during overland flow and in connection with flashy flows within or outside the banks of drainage channels.

Environmental Consequences of Leasing and Potential Future Development

Potential effects of oil and gas developments on soils include changes to the local topography resulting from surface disturbance, increased slope instability, mass movement in areas of geologic instability, and increased sedimentation due to soil erosion and transport into adjacent drainages. Operation of heavy equipment can also damage soils through compaction, and soils that are stripped and stockpiled for later use in site recontouring and reclamation lose their soil structure, often have altered texture, and have lower levels of organic matter, which affects fertility, texture, and moisture holding capacity.

The greatest source of loss or damage to the soil resource is typically through construction activities or placement of permanent features on steep slopes. Therefore, application of the two following stipulations would greatly reduce the potential for slope failure associated with oil and gas activities:

- UFO-NSO-Steep Slopes Greater than 40% – Prohibits surface occupancy or use and surface-disturbing activities on slopes steeper than 40%.
- UFO-CSU-Steep Slopes 30-39% –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters.

The second stipulation also states that the BLM may require engineering and reclamation plans described how the proponent would mitigate potential effects to slope stability. Other sources of soil erosion or reduced long-term function as a growth medium for desirable plants are addressed through mitigation measures applied as COAs under BLM's regulatory authority (see below).

Cumulative Impacts of Leasing and Potential Future Development

Unavoidable surface disturbance, operation of heavy equipment, changed or increased runoff due to unvegetated surfaces, and the delay before revegetation is fully successful would be expected to lead to

soil loss and reduced vegetation cover, which in turn could lead to less stable slopes. It is not possible to predict the scale and intensity of future projects, or their location relative to different soil types, but the stipulations above would keep future project-related surface disturbance off steep terrain.

Impacts of soil loss and reduced productivity would be cumulative to similar impacts associated with other present or reasonably foreseeable oil and gas projects within the CEAA, and with past projects recent enough that disturbed areas are not fully restored. The impacts would also be cumulative to impacts associated with past and present surface components of subsurface coalmining operations, surface sand and gravel operations, road and pipeline construction projects, and grazing operations. The large portion of the CEAA underlain by Federal fluid minerals (**Table 1**) indicates that most existing or future projects would be managed by the BLM and/or Forest Service, with similar stipulations and COAs.

3.4.10 Threatened or Endangered Species

Affected Environment

Species protected under the Endangered Species Act (ESA) as threatened or endangered and potentially present in proximity to the five UFO parcels, or not present nearby but potentially affected by future oil and gas projects authorized under subsequent site-specific NEPA analysis, are listed in **Table 6**. The table reflects a letter from USFWS dated July 6, 2018. As described previously, issuing leases is an administrative action that does not authorize any surface-disturbing activities or other use of the surface or subsurface for development of oil and gas resources within the leasehold.

Table 6. Listed or Proposed Threatened or Endangered Species Present or Potentially Affected by Potential Future Oil and Gas Development

Listed Species	*ESA Status*	*Critical Habitat*	*Effects Determination for Future Projects* [1]
Canada lynx, *Lynx canadensis*	Threatened	None in Vicinity	No Effect
North American wolverine, *Gulo gulo luscus*	Proposed Threatened	None in Vicinity	No Effect
Yellow-billed cuckoo, *Coccyzus americanus*, Western Distinct Population Segment	Threatened with Proposed Critical Habitat	Proposed in North Fork Gunnison near Bowie	No Effect
Razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and bonytail chub (*Gila elegans*)	Endangered with Critical Habitat	Mainstem Gunnison and lower North Fork Gunnison	Likely to Adversely Affect [2]
[3] Green Lineage Colorado River cutthroat trout, *Oncorhynchus clarkii* cf. *pleuriticus*	Threatened	None Designated	No Effect

[3] See text following the table for explanation of effects determination.

[2] Tiered to the USFWS (2017) Programmatic Biological Opinion (PBO) for water depletions from the Colorado River Basin of western Colorado in connection with BLM-authorized oil and gas developments.

[3] Green Lineage Colorado River cutthroat trout is indigenous to the Colorado, Gunnison, and Dolores River Basins. It currently is designated as threatened pending further evaluation of ecological and taxonomic status.

Because some level of future development of the leases is a likely outcome, this section addresses effects on ESA-listed or proposed species reasonably anticipated to be associated with any future oil and gas projects, based on known distribution and habitat requirements of the species in relation to the parcels, and on protective lease stipulations to be attached to the parcels as appropriate. Any future oil and gas development would require project-specific NEPA analysis and, if a listed or proposed threatened or

endangered were potentially affected, consultation with the USFWS pursuant to Section 7 of the ESA. The BLM would not approve any future project until the USFWS consultation has been completed, and identified conservation measures have been incorporated into project design.

Canada Lynx. Canada lynx occupy boreal, sub-boreal, and western montane forests and mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (Ruggiero et al. 2000). In the western United States, they are associated with subalpine fir, Engelmann spruce, and mesic lodgepole pine, and in quaking aspen cover types when mixed with coniferous habitat types. Primary Canada lynx habitat in Colorado is found mostly between 10,000 feet and 12,000 feet elevation, the lower end of which is above the highest elevation in any of the parcels.

Habitats in and near the five UFO parcels consist primarily of oakbrush, mixed mountain shrublands, aspen stands, montane Douglas-fir stands, and mixed riparian woodlands, none of these considered suitable lynx habitat. Because the parcels are not within a mapped Lynx Analysis Unit (LAU) and are within unsuitable habitat, the five location do not locations necessary for the continued persistence of lynx on public lands in Colorado.

North American Wolverine. The North American wolverine the Rocky Mountain region of the lower 48 states was previously proposed for listing as threatened (USFWS 2013), but the proposed listing was withdrawn because the threats cited were not sufficient to support listing (USFWS 2014). In 2016, the U.S. District Court for the District of Montana vacated the 2014 withdrawal of the proposed rule to list the Distinct Population Segment (DPS) of the North American wolverine as threatened, and the wolverine is currently considered a proposed threatened species.

In Colorado, nearly all historical and recent reports of wolverines are from high elevation alpine areas, which is a habitat type not present in or near any of the five parcels. Until recently, the last confirmed wolverine sighting in Colorado was in 1919, but in 2009 a radio-collared male wolverine travelled from Grand Teton National Park, Wyoming, southward into Rocky Mountain National Park, Colorado.

Yellow-billed Cuckoo, Western Distinct Population Segment. The the Western Distinct Population Segment (DPS) of the yellow-billed cuckoo is listed under the ESA as threatened (USFWS 2014). Approximately 550,000 acres of critical habitat have been proposed throughout its range, including along the North Fork Gunnison River upstream to near the town of Bowie. This segment has been proposed as critical habitat for the species. None of the five UFO parcels is located near the proposed critical habitat. Potentially suitable habitat also occurs farther upstream along the North Fork Gunnison River to east of the town of Somerset, although the habitat is less dominated by cottonwoods and less continuous. None of the UFO parcels would be expected to receive use by the cuckoo except as transients.

Colorado River Endangered Fishes. The Colorado pikeminnow and razorback sucker occur in the Gunnison River from near the City of Delta to the confluence with the Colorado River and below that point, while the humpback chub and bonytail chub extend a shorter distance into Colorado from Utah. Populations of these fishes have declined throughout their historic range due largely to habitat loss or habitat degradation (mainly through dams and water diversions) and introduction of competitive and predatory non-native fish species. However, a review of the humpback chub has recommended down-listing this species to threatened status because the population recovery criterion included in the 2002 Humpback Chub Recovery Goals (USFWS 2002) was met over the past 5 years (USFWS 2018).

Unlike reaches farther downstream in the Gunnison-Colorado River Basin, the reach of the North Fork Gunnison and floodplain in proximity to some of the parcels is not known to provide spawning, nursery, feeding, and rearing habitats, or access to those habitats. However, impacts to these species from depletions in flows from the Colorado River Basin in connection with BLM-authorized oil and gas projects, and potentially the loss of eggs, larvae, and juveniles during withdrawal of water from the Colorado River Basin for use in oil and gas projects, led to the issuance of by USFWS (2017) of a Programmatic Biological Opinion addressing these issues.

Green Lineage Colorado River Cutthroat Trout. Recent genetic and meristic studies have provided evidence of six historical native lineages of cutthroat trout in Colorado (Metcalf et al. 2012, Bestgen et al. 2013). Two of these lineages are native in the greater Colorado River Basin, of which one, described as the Green Lineage Colorado River cutthroat trout, is native to headwaters and tributaries of the Colorado, Gunnison, and Dolores river basins. Until the taxonomy of indigenous (native) cutthroat trout subspecies in Colorado is resolved, the USFWS is treating the Green Lineage cutthroat as a threatened species, under the listing authority for the greenback cutthroat trout (*Oncorhynchus clarkii* ssp. *stomias*), to which the western populations were previously ascribed. Native cutthroat trout in Colorado are limited to relatively clean, cold headwaters streams and ponds. Green Lineage cutthroat trout have been documented by CPW in the following streams located in or near the five UFO parcels (**Map (1)**. More detailed maps are provided in Attachment E.

- Parcel 8140 – Henderson Creek (eastern portion), Clear Fork Muddy Creek (western portion)
- Parcels 8320 and 8351 – Deep Creek (eastern portion of 8351 only)
- Parcels 8135 and 8138 – Hubbard Creek (8138 only)

The populations of Green Lineage cutthroat in Clear Fork Muddy Creek and Henderson Creek (parcel 8140) are not genetically pure, due to hybridization with stocked rainbow trout (*Oncorhynchus mykiss*) or non-native subspecies of cutthroat trout. Fish in Rock Creek and the South Fork of Twin Creek, tributaries of East Muddy Creek upstream from parcel 8140, are genetically pure and considered core conservation populations.

Environmental Consequences of Leasing and Potential Future Development

Potential impacts of future development would be addressed in a required site-specific NEPA analysis and documentation. For reasons described previously, it is not possible at the leasing stage to know precisely where, when, at what scale and intensity, and for what duration any future oil and gas activities might occur. The following paragraphs address impacts that might reasonably accompany such projects and the bases for the determinations of effects for listed or proposed threatened or endangered species summarized in **Table 6**.

Canada Lynx. While be no long-term or persistent lynx residency is anticipated in the area of the UFO parcels, the potential exists for lynx to pass through the area as they seek out or disperse to suitable habitats. If transient lynx were to utilize the area for dispersal, future development would not be anticipated to create barriers precluding lynx dispersal. For this reason, because any identified potential for impacts to lynx would be addressed at the time through ESA Section 7 consultation, and with the application to all leases of **Exhibit CO-34** for threatened or endangered species, the BLM has concluded that the lease sale and potential future development would have "**No Effect**" on the Canada lynx.

North American Wolverine. Currently, no wolverines are known to occur in Colorado, and it is extremely unlikely that a wolverine would occur in the vicinity of the parcels, even as a transient. For this reason, because all leases would have statewide **Exhibit CO-34** for threatened or endangered species, and because any future projects with the potential to affect the wolverine would be addressed in Section 7 consultation with the USFWS during site-specific NEPA, the BLM has concluded that the lease sale and potential development would have "**No Effect**" on the North American wolverine.

Yellow-billed Cuckoo. As noted above, known cuckoo habitat in proximity to proposed UFO parcels is in riparian habitat along the North Fork Gunnison River. Critical habitat has been proposed as far upstream as Bowie; no parcels are located within the 0.5-mile buffer for this reach of the river. Potentially suitable habitat also occurs farther east to beyond Somerset, and none of portions near Paonia Reservoir lies within 0.5 mile of the North Fork Gunnison riparian corridor. Based on the lack of suitable habitat (except potentially for occasional use by transients), the application of statewide **Exhibit CO-34** to all parcels, and the requirement for site-specific NEPA analysis and, if needed, ESA Section 7

consultation for any future development representing potential impacts, the BLM has concluded that leasing and potential future development of the UFO parcels would have "**No Effect**" on the yellow-billed cuckoo.

Endangered Colorado River Fishes. No oil and gas projects would be authorized under this EA, and any future development would address potential impacts to the Colorado pikeminnow, humpback chub, bonytail chub, and razorback sucker through reference to the analysis in the PBO of withdrawals of water and associated depletions in flows associated with Federal oil and gas development (USFWS 2017). Consequently, the effects determination in the PBO of "**May Affect, Likely to Adversely Affect**" for leasing and potential future development does not require ESA Section 7 consultation. The PBO includes a conservation measure requiring annual reporting of water consumption used for well development, dust abatement, and pipeline testing, and screening of water withdrawal pipes to avoid or minimize direct loss of eggs, larvae, or juveniles during withdrawals from occupied reaches.

Potential magnitude of use of water from the Colorado River Basin and potential withdrawal points due to potential developments are unknown because of uncertainties regarding future location, scale, intensity, and timing/duration of any such developments. However, compliance with the mandatory conservation measures in the PBO would conform to the effects determination and the associated determination by the USFWS that doing so would avoid jeopardizing the recovery of continued existence of the species.

Green Lineage Colorado River Cutthroat Trout. Potential direct impacts could include inflow of sediments from areas of surface disturbance related to construction activities and long-term road use, and potential inflow of chemical pollutants related to oil and gas activities. Spills or other releases of chemical pollutants as a result of oil and gas activities are infrequent due to the various design requirements for well pads and access roads specified the BLM, Forest Service (no National Forest System Lands are included in the UFO parcels but occur nearby), and State of Colorado. In the event of a spill or accidental release, the operator would implement its mandatory *Spill Prevention, Control, and Countermeasures* (SPCC) Plan.

Statewide **Exhibit CO-34** for threatened or endangered species applies to all parcels. This exhibit alerts lessees to the potential presence of threatened or endangered species and discloses lease activities may require consultation with the U.S. Fish and Wildlife Service and may result in additional limitations or denial of proposed activities. The parcels also have the following stipulations where applicable:

- UFO-NSO-Native Cutthroat Trout – Prohibits surface occupancy or use within 325 feet of the edge of occupied habitat for conservation populations (90% pure or greater) of native trout.
- UFO-NSO-Hydrologic Features – Prohibits surface occupancy or use within 325 from the outer edge of a stream, riparian area, or wetland.
- UFO-CSU-Hydrologic Features –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, within a zone 325 to 500 feet beyond the outer edge of a stream, riparian area, or wetland.
- UFO-TL – Coldwater Sportfish and Native Warmwater Fish – Prohibits work within any stream segment occupied by these species, including the Green Lineage Colorado River cutthroat, during the spawning season of April 1 to July 15.

Based on these protections, the BLM has concluded that leasing and potential future development of the five UFO parcels at the December 2018 lease sale would have "**No Effect**" on the Green Lineage Colorado River cutthroat trout.

Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed parcels in the UFO area would not be offered at the December 2018 Competitive Oil and Gas Lease Sale. Therefore, the potential for direct impacts on listed

or proposed threatened or endangered species would not occur in relation to oil and gas activities in these parcels. However, currently permitted activities and other ongoing activities in the area, and associated impacts, would continue. These would include impacts associated with ranching, recreation, and vehicular travel on both Federal and private lands, and potentially with existing or new residential development or other surface-disturbing activities on private lands. Wildland fires, flooding, reduction in vegetation cover due to drought or grazing, and other natural events could also change the condition of the parcels in ways that are detrimental to these fishes.

Cumulative Impacts of Leasing and Potential Future Development

Because of the protections of the ESA, and the lease stipulations described above, potential direct and indirect impacts to listed or proposed threatened endangered species from future development would be expected to be avoided or minimal. This is also true for all other Federal projects to which future development of these parcels would be cumulative, and to some degree is also true of energy, resource, or land development projects and other activities on private lands subject to a Federal nexus and the protections of the ESA. Moreover, the small area of the five UFO parcels currently proposed for leasing in relation to existing Federal oil and gas leases in the CEAA suggests that the cumulative impacts of these parcels would be small.

Potential Future Mitigation

Future oil and gas development of some or all of the UFO parcels would undergo site-specific NEPA analysis and documentation and, if necessary based on biological surveys, other information, and detailed project information, and associated ESA Section 7 consultation. Mitigation measures to be applied to the projects would include conservation measures identified in BLM's Biological Assessment and in the concurrence letter or Biological Opinion prepared by the USFWS. Conservation (mitigation) measures regularly applied by the BLM for oil and gas projects include measures to prevent or minimize the transport of sediments and any chemical pollutants from well pads surfaces and roadways to surface waters by overland flow or along tributary channels.

Spills or accidental releases of chemical pollutants as a result of oil and gas activities associated with Federal leases are infrequent due to design requirements for wells and well pads, associated surface facilities, and access roads specified the BLM, even if on private land, in addition to the requirements by the State of Colorado through the Colorado Oil and Gas Conservation Commission (COGCC) and the Colorado Department of Public Health and Environment (CDPHE) through its delegated authority under the Clean Water Act. Increasing reliance on use of buried pipelines instead of haul trucks to transport liquid condensate (oil) accompany production of natural gas, and of produced water also brought to the surface, has further decreased the risk of spills and accidental releases into the environment. In the event of a spill or accidental release, the operator is required to implement its mandatory *Spill Prevention, Control, and Countermeasures* (SPCC) Plan and other mitigations identified by the BLM.

3.4.11 Transportation and Access

Affected Environment

State Highway 92 (Delta to Hotchkiss) and State Highway 133 (Hotchkiss to Carbondale) would be the primary access roads used to access the UFO parcels from the west and north, respectively. From these paved roads, access to the parcels would be on smaller, unpaved county roads (e.g., the Gunnison County Buzzard Divide Road off State Highway 133 at the north, and potentially the Delta County Stevens Gulch Road and Hubbard Canyon Road off State Highway 133 at the south), and thence on more minor Forest Service or private roads, and potential roads constructed for coalmining. Between Hotchkiss and Carbondale, State Highway 133 is part of the West Elk Loop Scenic and Historic Byway.

Average daily traffic for all types of vehicles on State Highway 133 in 2015 (CDOT 2017) was 5,000 (including 175 trucks) on Bridge Street in Hotchkiss; 2,700 (including 132 trucks) at the intersection with

State Highway 187 at Paonia; 2,100 (including 210 trucks) at the eastern intersection with Bowie Road; 1,900 (including 135 trucks) at Somerset; 1,200 (including 122 trucks) at the intersection County Road 12 (Kebler Pass Road) at Paonia Dam; and 1,500 (66 trucks) north of the intersection with County Road 3 (Marble Road).south of the turnoff.

Environmental Consequences of Leasing and Potential Future Development

Access to the UFO parcels would use existing public or private roads to the extent possible, although some new roads, mostly consisting of short spurs (less than 1 mile) are likely. The location and alignment of new or upgraded roads associated with future oil and gas developments are unknown, as is the potential timing of these activities and the intensity and duration of use. In general, however, future development would cause a substantial increase in truck traffic on existing roads, particularly during construction, drilling, and completion activities and then declining dramatically during long-term production. It also is unknown what portion of increased traffic would occur on State Highways 92 and 133. However, because this route is the primary route for access to the general area and currently receives substantial use, the percentage increase would be less than on the existing county roads, and smaller interior roads, which currently receive low or very low levels of use.

Impacts expected to accompany increased traffic during future oil and gas projects include increased levels of fugitive dust, increases noise levels along currently lightly used roads, and increased risk of collisions or other accidents, including collisions with wildlife. The lack of current knowledge on where, at what level, and during what timeframe development would occur makes it impossible to assess these quantitatively. However, this type of analysis would be a key part of future site-specific NEPA required for planning and, potentially, permitting future projects.

Oil and gas developments can also damage roads or require additional maintenance and repair. These costs are borne by the lessee/operator, either directly or, for public roads, through agreements with the county. Increased costs associated with maintenance or repair of State and U.S. Highways is much less of an issue because of the way these roads are already designed and built to hand heavy truck traffic, and because increases in traffic would be proportionately less than with county roads.

A major determiner of traffic levels involving heavy haul trucks would be the extent to which each individual project, and overlapping multiple projects, would be able to meet their requirements for water handling using pipelines. In addition to unknowns regarding the scale and potential for concurrent timing of future projects is the wide range in water needs depending on the type of drilling used, the amount of produced water generated and the lessee/operator's ability to treat and re-use that water or first-use fresh water, and the location of the water source. Although recent trends in oil and gas development include greater use of pipelines instead of haul trucks, this is not always possible, depending on the distance from the source, and the degree to which the scale of initial development in an area justifies the upfront investment in pipeline infrastructure—especially true in unproven "exploratory" areas.

Cumulative Impacts of Potential Future Development

Traffic associated with future oil and gas development of the UFO parcels would be cumulative to both existing and future traffic associated with additional oil and gas projects and to traffic associated with other uses, including general commercial use as well seasonal hauling of agricultural products. Most traffic increases affecting the State Highway 92-133 corridor would occur during construction, drilling, and completion activities. During long-term production, traffic levels would be dramatically reduced and probably not discernible on the primary access roads, but discernible on the internal road network, which would receive light but regular use for monitoring and minor maintenance, short-distance haulage of water and condensate to centralized facilities, and application of water or a chemical suppressant to suppress fugitive dust. The potentially greatest cumulative effect would occur if development activities of the UFO parcels occurs concurrently with each other, and concurrently with some of the reasonably foreseeable future development sharing the State Highway 92-133 corridor.

Potential Future Mitigation Measures

The primary means for reducing truck traffic is the use of pipelines instead of haul trucks to move water needed for drilling and completions activities, and for frequent water to control fugitive dust during construction. During production, use of pipelines to move liquid condensate (oil) and produced water is also beneficial, but these traffic volumes are much lower. In general, the BLM cannot require use of pipelines instead of haul trucks during well development. However, if a substantial increase in traffic accompanies delivery of water from a distant source, the BLM would work with the operator to establish truck-pipeline transfer points at locations that would reduce traffic on small, low-volume roadways.

Impacts from fugitive dust are addressed by a requirement for regular watering during construction, which adds some traffic but at a localized scale. During long-term production and maintenance, dust abatement typically includes use of a chemical suppressant such as magnesium chloride, which provides more durable dust control and helps reduce road damage to unpaved surfaces.

Noise associated with truck traffic is addressed in the Section 3.4.4 (Noise). The risk of increased collisions with other vehicles or wildlife, or of truck accidents generally, is addressed by requiring project-related traffic to adhere to applicable speed limits, and to avoid travel during hazardous driving conditions. The BLM also applies a COA prohibiting the use of engine braking ("jake brakes") on local roads, and where on larger roads where prohibited by county or local road departments.

3.4.12 Vegetation – Upland, Riparian, Wetland, and Invasive Non-native Species

Affected Environment

The area of the five UFO parcels consists almost entirely of upland vegetation types, with riparian areas primarily along perennial streams, wetlands along drainages and at seeps and springs, and areas with infestations of invasive non-native species.

Upland vegetation across the bulk of the area consists of a mosaic of Gambel's oak (*Quercus gambelii*) shrublands ("oakbrush"), sometimes occurring as taller, single-trunk trees in open woodlands. Both the shrubland and woodland forms The oaks may form rather extensive stands on favorable sites, generally with gentle to moderate slopes in areas of elevated moisture, such as on north-facing slopes and along minor drainageways. More commonly, the oaks occur in a patchwork with meadows of mostly native perennial cool-season grasses and native forbs, or with shrublands of mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Parry's rabbitbrush (*Chrysothamnus parryi*), rubber rabbitbrush (*Chrysothamnus nauseosus*), or roundleaf snowberry (*Symphoricarpos rotundifolius*). Bitterbrush (*Purshia tridentata*) is sometimes present, as is mountain-mahogany (*Cercocarpus montanus*) at the lowest elevations and on warm, dry, mostly rocky sites.

This habitat type grades into two different coniferous types at the upper and lower margins in both elevation and soil moisture. Montane areas include stands or patches of Douglas-fir (*Pseudotsuga menziesii*), while subalpine areas, limited in size and occurrence, are mostly Douglas-fir mixed with some Engelmann spruce (*Picea engelmannii*). Quaking aspen (Populus tremuloides) occurs throughout, while Rocky Mountain juniper (*Juniperus saximontana*) is mostly on sunny, drier sites. At the lower and drier end of the continuum, Rocky Mountain juniper and pinyon pine (*Pinus edulis*) may form woodlands.

Perennial streams often support tall willows (*Salix* spp.), thinleaf alder (*Alnus incana*), western river birch (*Betula occidentalis*), or common chokecherry (*Prunus virginiana* var. *melanocarpa*), and the shorter redtwig dogwood (*Cornus sericea*) and twinberry honeysuckle (*Lonicera involucrata*). These riparian shrubs are mixed with Douglas-fir, blue spruce (*Picea pungens*), Rocky Mountain juniper, and quaking aspen along more major streams; narrowleaf cottonwood (*Populus angustifolia*) may also be present and becomes dominant along reaches of the North Fork Gunnison.

Some frequently saturated or seasonally inundated areas along drainages may support herbaceous wetland vegetation consisting of grasses, sedges, rushes, and forbs classified as obligate or facultative wetland

indicator species. A low shrub, shrubby cinquefoil (*Dasiphora fruticosa*) is present along some stream margins at higher elevations. Seeps and springs also commonly support wetland vegetation.

While most meadows or forest and woodland openings support native perennial grasses and native forbs, invasive non-native forbs, mostly annual or biennial species, occur as localized infestations in disturbed or severely degraded areas, and as narrow linear stands along some roadways. Seeds of these species are commonly spread on the feet and legs of livestock, or in mud and dirt attached to the wheels and undercarriages of vehicles. Weed seeds may also be imported in gravel used on roadways, fill dirt used in construction, and seed mixes used for agriculture.

No special status plants—including threatened or endangered species or BLM sensitive species—are known or expected to occur in or near the UFO parcels.

Environmental Consequences of Leasing and Potential Future Development

Potential future oil and gas projects involving the UFO parcels would impact vegetation, primarily upland vegetation, during construction of well pads, roads, and pipelines. It is not possible to predict the amount of direct vegetation loss at this time due to many uncertainties involving numbers and locations of well pads, alignments and lengths of new or widened access roads or pipeline corridors, and potential additional surface facilities. No future oil and gas projects would be authorized by this EA and instead would require site-specific NEPA analysis when details of the projects and of site conditions in the affected areas have been determined.

Direct impacts to wetlands would generally be avoided, unless disturbance of a jurisdictional wetland is authorized by the U.S. Army Corps of Engineers by a Nationwide or Individual Permit under Section 404 of the Clean Water Act. Riparian areas also would mostly be avoided, except where crossings of the associated drainages are needed for road or pipeline construction. No special (rare or unusual) plant communities are known to occur in or near the parcels, but these would be avoided to the extent possible if identified during future NEPA planning for individual projects.

The following stipulations would be applied to protect plant resources:

- UFO-NSO-Hydrologic Features – Precludes surface occupancy or use within 325 feet of streams, riparian areas, and wetlands.
- UFO-CSU-Hydrologic Features –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, within a zone extending 325 to 500 feet away from streams, riparian areas, and wetlands.
- UFO-CSU-Plant Community –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect significant and/or relict plant communities.

Planning of future oil and gas activities as part of future site-specific NEPA analysis would include working with the lessee/operator to avoid or minimize impacts to higher quality vegetation types, including those of particular importance to wildlife. On private surface, the landowner may assert a preference for developing in native habitats instead of modified habitats such as pastures used for hay production or livestock grazing.

Indirect impacts to vegetation from oil and gas activities are related to reduced soil productivity during stripping and stockpiling from pad sites and road/pipeline alignments for later use in reclamation; compaction and loss of structure and changes in texture from operation of heavy equipment; potential soil loss and erosion; and invasion or expansion of weeds, which compete with native species for space, moisture, and nutrients. Mitigation of vegetation impacts through application of COAs is summarized below.

Cumulative Impacts of Leasing and Potential Future Development

Direct and indirect loss or degradation of vegetation during future oil and gas projects would be cumulative to similar impacts from past, present, and reasonably foreseeable future projects involving replacement of vegetation with surface facilities, temporary disturbance of other areas with permanent changes in soil characteristics, reduced plant vigor that allows invasion by weeds, and direct importation of weed seeds on the wheels or tracks and undercarriages of mobile equipment.

Decreases in vegetation cover and vigor are often more conspicuous at a site-specific level than are widespread decreases associated with grazing, but as a percentage of a given area may be lower. On private lands, agricultural uses and rural residential developments may include extensive vegetation loss or modification, and infestations of weeds. Cumulative impacts may be greater on private surface, and particularly on lands used for development of private minerals, than on Federal lands in relation to area.

Because most of the CEAA includes lands managed by the BLM or USFS (**Table (1)**, future development of currently leased and potentially leased lands would be expected to include the types of protective stipulations and/or the types of mitigation measures as associated with future development of the five currently proposed parcels. Within the large area represented by existing, currently proposed, or potential future Federal leases, the amount of direct habitat and the degree of reduced vegetation quality in revegetated areas is expected to be relatively small, as is generally the case for Federal oil and gas projects. Expected cumulative impacts on vegetation associated with oil and gas would be minor overall.

Potential Future Mitigation

During project-specific NEPA planning for future oil and gas developments of the UFO parcels, the BLM would work with the lessee/operator to minimize direct and indirect vegetation impacts. Examples of design features and COAs associated with planning of oil and gas projects include:

- Placement of well pads and alignment of roads and pipelines to avoid or minimize impacts to higher quality plant communities.
- Using the fewest pads possible to accommodate a reasonable level of development, made easier in recent years by advances in directional and horizontal drilling.
- Requiring prompt and effective reclamation designed to preserve viability of salvaged topsoil being stored for later use; properly preparing the soil seedbed, including adding any amendments needed based on soil type and condition; creating a diverse native seed mix; applying strict restrictions on presence of weed or other undesirable seeds; requiring annual monitoring and treatment of weeds and annual monitoring of reclamation progress; and requiring remedial measures, potentially including repeating the revegetation effort if necessary for success.

3.4.13 Visual Resources

Affected Environment

The primary sensitive viewing area in the vicinity is along State Highway 133, which is designated by the State of Colorado as part of the West Elk Loop Scenic and Historic Byway. The viewshed from McClure Pass to north of Paonia Reservoir captures the rolling foothills and valleys below and to the west of Ragged Mountain and Chair Mountain. Within this setting, human presence may be evident on private in-holdings in a pastoral setting with ranching operations, wood fences ranch homes, cabins, and pastures. Livestock grazing and dispersed recreation are noticeable but do not dominate the landscape.

Along the lower Muddy Creek valley and then turning west below Paonia Dam, views are less expansive initially, being confined by the narrow valley. Although more constrained in distance, the view is visually interesting due to the river corridor, adjacent rocky bluffs, higher slopes, and diverse vegetation associated with these different areas. The presence of coal mining facilities imparts an industrial

component in the area of Somerset and Bowie. Closer to Paonia, as the valley widens, views become more distant, and areas on the valley floor include agricultural, residential, and commercial developments.

Within the interior area surround the parcels, rolling hills and low ridges support a mosaic of aspens, oaks, meadows, and agricultural pastures, with tall montane conifers in sheltered or cooler, moister areas. The area is punctuated throughout with ranch buildings, agricultural pastures, rural residences, and existing oil and gas facilities. Along generally east- or south-draining ephemeral, intermittent, and perennial streams, the terrain is often much steeper, rockier, and more sparsely vegetated with shrubs and grasses characteristic of warmer, drier conditions.

Throughout much of the area encompassing the UFO parcels, natural night skies are notably dark due to the absence or widely dispersed development.

The BLM applies Visual Resource Management (VRM) requirements to projects to mitigate impacts to landscape character, consisting of form, color, texture, and line. Visual resource management includes four management classes: Class I, Class II, Class III, or Class IV. BLM lands within and near the five UFO parcels are designated as VRM Class II (Parcels 8320 and 8351 near State Highway 133 and Paonia Reservoir) or VRM Class III (BLM lands near split-estate parcels 8140, 8135, and 8138). These two classes have the following BLM management objectives:

- VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- VRM Class III – Partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

While VRM objectives do not apply to non-BLM lands, the BLM addresses split-estate lands (e.g., Parcels 8140, 8135, and 8138) during development of underlying or nearby Federal fluid minerals.

The West Elk Loop Scenic and Historic Byway corresponds with State Highway 133 through the general area; known for its history, it also showcases towns of varied lifestyles and natural beauty. The Delta County Master Plan references the Scenic Byway and the protection and interpretation of the cultural heritage and natural resources in the area. The Delta County Master Plan also states the following goal:

> "The preservation of the rural lifestyle and landscape, which includes the natural environment and unique physical characteristics of Delta County. Natural resources associated with the rural landscape include open space and scenic viewsheds, and includes a desired strategy to map the significant physical features and environmental characteristics of the County, such as important scenic viewsheds."

The Town of Paonia has also developed a Highway 133 Corridor Master Plan, which specifically states as a goal that, "*The open scenic character of the West Elk Scenic Byway shall be protected*." It also states that new development should not detract from the rural qualities of the highway corridor and Paonia's small-town character.

Environmental Consequences of Leasing and Potential Future Development

Visual impacts of subsequent development of the UFO parcels could affect landscape character. For example, temporary or permanent facilities that have height, such as produced water, condensate, or oil storage tanks, would provide a strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation. New roads and pipelines would also create contrasts in line, color, and texture. Since potential oil and gas well locations cannot be accurately determined at the

leasing stage, it is not possible to predict the visual impacts. The visual impacts of these types of impacts depends on their proximity to roads and areas of regular human use, their visibility from these areas if located farther away, and the overall naturalness of the setting where they are located. The degree to which new oil and gas facilities affect scenic quality is also a function of the extent to which they are novel, or newly introduced into an area.

The possible effects on nighttime lighting of drilling activities would have a temporary affect and would impact those in proximity to the drilling activity. In most instances, the light from the operation would be visible as a point of light in the landscape, similar to headlights of passing vehicles. This impact would be much less, and locally negligible, in proximity to residential, commercial, and light industrial facilities along State Highway 133 near Paonia and Hotchkiss.

Although most measures to reduce visual impacts would be associated with planning, design, and implementation of future oil and gas activities (see below), the following lease stipulation would apply to Parcels 8320 and 8351 near Paonia Reservoir:

- UFO-CSU-Scenic Byways –The BLM may restrict surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, within 0.5 mile (805 meters) of State Highway 133.

At the leasing stage, it is not possible to evaluate potential impacts to users of the proposed Carbondale to Crested Butte Trail, which wanders below the western edge of Ragged Mountain east of State Highway 133. Distance alone would substantially minimize impacts of future oil and gas development of the UFO in locations visible from the trail. This would be addressed during future NEPA planning for oil and gas projects and, where appropriate, mitigation measures would be applied (see below).

Cumulative Impacts of Leasing and Future Development

Cumulative impacts of any future development of the UFO parcels would depend on the location, scale, and intensity of the development in relation to naturalness of the setting, the presence of topographic and vegetation screening, and the spatial relationship to roads or other key observation points and to existing or other future development. Except for parts of the parcels along State Highway 133 near Paonia Reservoir, none of the parcels would be visible from the highway. However, upon leaving the highway and driving into the interior areas closer to and within the parcels, visual impacts would occur.

Cumulative impacts from the combination future development of the UFO parcels and existing or unrelated future developments could occur if industrial facilities (e.g., well pads or tank farms) or other stark visual contrasts (e.g., new roads and pipelines) occur at a density that allows multiple sites to be seen from an observation point, the effect could be to change the character of that area from natural, rural residential, or agricultural to industrial. If facilities or other stark contrasts at a low density but through a large area, the effect on visual quality may be less dramatic at a given location but equally or more impactful for people who travel through the larger area.

Because visual impacts of oil and gas facilities can be reduced somewhat through proper planning and placement, they cannot be avoided. Consequently, the level of cumulative impacts is little affected by the proportion of future project or reasonably foreseeable future developments on Federal vs. private lands. The greatest influence would be on the scale (total area) and intensity (density) of future oil and gas developments. While it is not possible to assess these aspects at the leasing stage, the small area of the five UFO parcels (2,830.55 acres), representing 2.7% of the total area of existing Federal oil and gas leases in the CEAA area (105,730 acres) shown on **Map 1**, indicates a relatively small addition to the cumulative visual impact in the CEAA associated with the Federal minerals.

Potential Future Mitigation

As part of reviewing and approving oil and gas development proposals, visual impacts would be analyzed and mitigated by applying COAs. This would apply on Federal surface as well private surface (split-

estate) parcels or portions of parcels. This process begins by working with the operator to locate well pads and other surface facilities at locations with topographic or vegetation screening to reduce visibility from roads, rural residences, or other key observation points. In uneven terrain, cut-and-fill slopes are minimized to the extent possible. Alignments or roads and pipelines (these being collocated when possible) are also selected to reduce visual contrasts.

COAs applied to specific locations may involve where tall facilities (e.g., storage tanks) are placed on a pad, potentially a requirement for low-profile tanks, choice of a paint color to blend with the surroundings, use of a paint with a non-reflective surface, and requiring that lights are downcast and include as little spread as possible without compromising safety. In most cases, the BLM requires salvaged topsoil to be placed in a low berm around the perimeter of the pad as way to enhance soil viability for future use in revegetation (see **Section 3.12**, Vegetation). This has the additional benefit of helping to obscure the pad's working surface and much of the equipment. In visually sensitive locations, the BLM may also require construction of a higher berm, with an irregular height and footprint width, to hide some of the taller equipment from key viewing points.

3.4.14 Wastes – Hazardous or Solid

Affected Environment

USE, STORAGE, GENERATION, AND DISPOSAL OF HAZARDOUS WASTES

Federal laws and BLM policies regulating hazardous wastes or other hazardous materials include:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) – Prohibits discharge of pollutants into Waters of the U.S., which by definition would include any tributary or dry wash that eventually connects with a perennial stream.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Public Law 96-510 of 1980) – Provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are EPA plans), the Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), and the BLM CRVFO Hazardous Materials Contingency Plan.
- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) – Regulates the use of hazardous substances and disposal of hazardous wastes. Most of the drilling and production wastes that would be generated by any future development of the UFO parcels would be exempt from the RCRA hazardous waste regulations (e.g., produced water, produced gas). However, the exemption would not relieve the operator from corrective action to address releases of both exempt and non-exempt wastes.

In addition to the requirements of these Federal laws, BLM Instruction Memoranda WO-93-344 and CO-97-023 require that all NEPA documents, including future site-specific NEPA for oil and gas projects, list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed as a result of a project. Practices commonly used in oil and gas developments are dictated by various Federal and State laws and regulations and the BLM standard lease terms and stipulations that would accompany any leases issued pursuant to this EA.

TRANSPORT OF NATURAL GAS AND LIQUID CONDENSATE THROUGH UNREGULATED GATHERING LINES

Although produced gas and liquid condensate are exempt from RCRA hazardous waste regulations, such wastes could present a hazard to human health and the environment. In recent years, public concern has

been raised regarding the risk of rural gathering pipelines to public safety. Consequently, the regulatory framework of gathering pipelines has undergone and continues to undergo revisions. While the BLM may evaluate the siting and potential environmental impacts of pipeline activities, as well as perform environmental surface inspections on public lands, the Federal pipeline safety program resides within the U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA has the primary responsibility for the promulgation and enforcement of Federal pipeline safety standards. However, various Federal and State agencies oversee pipeline safety. Determining the specific agencies overseeing pipeline safety in a given scenario is not simple. An overview of hydrocarbon pipeline regulation is provided in "A Regulatory Review of Liquid and Natural Gas Pipelines in Colorado" published by COGCC (2014b).

In general, the PHMSA, Colorado Public Utilities Commission (COPUC), and COGCC oversee the pipeline safety of rural areas in Colorado. The PHMSA Western Region Office of Pipeline Safety inspects interstate natural gas and all hazardous liquids pipeline systems located in Colorado (Colorado Department of Regulatory Agencies 2018). The Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011 was designed to examine and improve the state of pipeline safety regulation. In 2016, the PHMSA published a notice of proposed rulemaking for gas transmission and gathering pipelines. The notice of proposed rulemaking will have three separate final rulemakings anticipated in 2019 largely focused on gas transmission, integrity management, and safety of gas gathering lines (USDOT 2018).

The COPUC's Gas Pipeline Safety Section (GPS) enforces the State's gas pipeline safety regulations in order to provide for the public safety of the citizens of Colorado (Colorado Department of Regulatory Agencies 2018). Through its 60105 Agreement with the PHMSA, COPUC's GPS conducts and carries out the inspection and monitoring of intrastate gas pipeline systems. The COPUC works with trade and technical organizations representing the pipeline industry, utility damage prevention, and other State and Federal Agencies. As excavation damage is currently the largest single threat to our state's pipelines, the Utility Notification Center of Colorado (UNCC) is an important resource for understanding the laws, methods, and means of reducing utility damage in Colorado.

To address public safety concern, COGCC began Rulemaking proceedings on flowlines on October 15, 2017 (COGCC 2018a). On February 13, 2018, the COGCC adopted Flowline Rules to address oversight of flowlines and related infrastructure associated with oil and gas development (2018b). COGCC defines a flowline as a segment of pipe transferring oil, gas, or condensate between a wellhead and processing equipment to the load point or point of delivery to a PHMSA- or COPUC-regulated gathering line or a segment of pipe transferring produced water between a wellhead and the point of disposal, discharge, or loading. The Flowline Rules include requirements for registration, installation, and design standards, transfer lines, transfer line valves, enhanced integrity management, abandonment, and financial assurance for produced water transfer systems, among other requirements.

Environmental Consequences

Pollutants potentially spilled or otherwise accidentally released during any future construction could include diesel fuel, hydraulic fluid, and lubricants associated with the operation of heavy equipment. These materials would be used during construction of well pads, access roads, and gathering pipelines and for refueling and maintaining the vehicles and equipment. Potentially harmful substances used during construction, drilling, completion, and production would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed in amounts above threshold quantities. Waste generated by construction would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes include those associated with well production and transmission of natural gas through the gathering pipelines and the natural gas itself.

With the exception of produced hydrocarbons, ethylene glycol (antifreeze), lubricants, and amine compounds, chemicals subject to reporting under Title III of the Superfund Amendments and

Reauthorization Act in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed during construction or operation of the facilities. None of the chemicals typically used in construction meets the criteria for an acutely hazardous material/substance or the quantities criteria per BLM Instruction Memorandum No. 93-344.

Solid waste (human waste, garbage, etc.) would be generated during construction, but primarily during drilling and completion because the workforce would increase during these activities.

Future NEPA analysis for specific oil and gas developments would address potential environmental impacts of gathering pipelines, as well as potential cumulative impacts. The following references a few of the EA sections that address gathering pipelines. Typical mitigation measures are described below.

Cumulative Impacts of Potential Future Development

Cumulative impacts of the use, transport, or storage of hazardous waste, and generation of solid waste—including transport via gathering lines—would would result if multiple incidents of spills or accidental releases resulted in exposures to human and other receptors at levels greater than for individual incidents, and if the additive exposure levels exceeded a threshold for harm. The risk of multiple spills or accidental increases as the number of activities posing those risks increases. Thus, increasing number of wells, miles or pipelines, and trips by haul trucks moving hazardous substances increases the associated risks proportionately.

For the five UFO parcels, all traffic related to oil and gas activities would access the area via State Highway 133, whether arriving from larger population centers and major highways to the west or north. Similarly, all surface drainages from the five parcels flow toward the North Fork Gunnison. The same is true for existing (past and present) activities as for reasonably foreseeable future activities. As a result, the statistical potential for cumulative impacts is additive among past, present, and reasonably foreseeable future actions.

Potential Future Mitigation Measures

Protective measures related to the hazardous or solid waste fall into two broad categories: engineering controls and administrative controls. Engineering controls are physical design features that address potential hazards and causes of failure. Administrative controls are plans and policies that restrict some activities and require others. Measures implemented to mitigate potential impacts associated with the use, storage, generation, and transport of hazardous materials and other wastes during any future oil and gas developments would include the following:

- No extremely hazardous substance, as defined in 40 CFR 355, would be produced, used, stored, transported, or disposed during construction or operation above permissible quantities.
- All tanks are required to be placed within an area of secondary containment equal to 110% of the volume of the enclosed tanks.
- Most current operations use a closed-loop drilling, which eliminates the storage of fluids containing hydrocarbons in open pits. Although the BLM cannot require closed-loop drilling, the BLM would require that any fluid-containing pits for any purpose other than storage of fresh water would be lined and equipped with a leak detection system.
- Where topography permits, production equipment would be monitored remotely by radiotelemetry to ensure prompt detection of leaks or other problems.
- Lessees/operators and their contractors would be prohibited from hauling hazardous materials by truck during unsafe conditions such as associated with muddy severe winter conditions.
- Trailers housing workers would be outfitted with self-contained sewage collection system, and regular trash collection would occur throughout drilling and well completion.

Mitigation measures for gathering lines would include use of high-strength steel, use of a corrosion-resistant coating and cathodic protection, wrapping the exterior with a protective material to resist corrosion and physical damage, burying at least 4 feet or deeper to avoid freezing, avoiding installation during frozen conditions, burying at least 4 feet at stream crossings, pressure-testing prior to use, promptly implementing revegetation of the corridor to reduce erosion of the overlying material, and regular monitoring of pressures, and regular monitoring of pipeline integrity.

In the event of any release of a hazardous substance to the environment in reportable quantities, the responsible party would be required to implement its *Spill Prevention, Containment, and Countermeasures* (SPCC) Plan and is liable for cleanup and monetary damages. Depending on the scope of the spill or release, the SPCC Plan or BLM's contingency plan would apply (or other governmental entity's contingency plan, depending on where the incident occurs). These laws, regulations, standard lease stipulations, and contingency plans and emergency response resources are expected to mitigate any potential hazardous or solid waste issues associated with future development.

3.4.15 Water Quality – Surface Water and Groundwater

Affected Environment

SURFACE WATER

In the general area of the UFO parcels, drainages experience high surface flows from both snowmelt and rainfall events. Snowmelt is typically generated from higher elevation headwater areas. Short-duration flooding typically occurs from intense, localized monsoon-driven events in mid to late summer, and has the greatest effect on intermittent and ephemeral channels. The five proposed parcels are within the North Fork Gunnison Sub-basin, which comprises the northern headwaters of the Gunnison Basin and extends from the Continental Divide to the confluence of the North Fork and mainstem of the Gunnison River about 9 miles downstream from Hotchkiss, Colorado. The North Fork Gunnison Sub-basin (8-digit USGS hydrologic unit) drains part of the Grand Mesa and Huntsman Ridge to the west and north, the Elk Mountains to the east, and the West Elk Mountains to the south. The proposed parcels are within two 10-digit USGS HUCs: East Muddy Creek and Hubbard Creek-North Fork Gunnison River.

Subwatersheds (12-digit HUCs) associated with the proposed UFO parcels are as follows:

- Parcel 8140 – Drains to Henderson and East Muddy Creeks and thence to Muddy Creek, as do other, unnamed tributaries, and thence to Paonia Reservoir (created by damming Muddy Creek) and the North Fork Gunnison.
- Parcels 8320 and 8351 – Most aliquots drain to perennial Williams Creek and Deep Creek, previously tributaries of Muddy Creek and now flowing into Paonia Reservoir, as do unnamed intermittent tributaries of Muddy Creek/Paonia Reservoir, and thence to the North Fork Gunnison. The most southwesterly aliquots drain to intermittent Thompson Creek, a tributary of the North Fork Gunnison.
- Parcels 8135 and 8138 – Drains to perennial Alder Creek (including intermittent Big Alder, Morman, and unnamed creeks) and perennial Hubbard Creek (including intermittent Wolf, Branch of Bee, Slide, Willow, Pilot, and unnamed creeks), and thence the North Fork Gunnison.

Specific use classifications and numeric water quality standards are adopted for specific stream segments in Colorado. The stream segments pertaining to the creeks downstream from the project area to the Town of Paonia are listed in **Table 7**, along with their defined classifications, and any listings of impairment or monitoring and evaluation (CDPHE 2017b, 2018a and 2018b). BLM policy is for activities initiated or authorized by the agency to ensure that water quality continues to support the designated uses.

Table 7. Designated Water Uses for Selected Streams in the Area of the UFO Parcels

Stream Segment	*Designated Uses* [1]	*Current Condition*
Muddy Creek and tributaries	Agriculture Class 1 Coldwater Aquatic Life Recreation Class E Water Supply	Current conditions mostly support those uses. Exceptions are East Muddy Creek for coldwater aquatic life (iron) and water supply (arsenic); and a segment of Muddy Creek for coldwater aquatic life (iron and temperature), water supply (iron and arsenic), and recreation (coliform bacteria).
Paonia Reservoir	Agriculture Class 1 Coldwater Aquatic Life Recreation Class E Water Supply	Paonia Reservoir is on Colorado's Monitoring and Evaluation list for dissolved zinc with regard to aquatic life.
Thompson Creek	Agriculture Class 2 Warmwater Aquatic Life Recreation Class P Water Supply	Current conditions are fully supporting these uses.
Hubbard Creek	Agriculture Class 1 Coldwater Aquatic Life Recreation Class P Water Supply	Current conditions fully support these uses.
Mainstem North Fork Gunnison from its inception to above Paonia	Agriculture Class 1 Coldwater Aquatic Life Recreation Class E Water Supply	Current conditions fully support these uses.

[1] Recreation Class E = Existing primary contact use (swimming, boating, waterskiing), April through September; Recreation Class P = Potential primary contact use, October through March

Paonia Dam and Paonia Reservoir are located on Muddy Creek, upstream of its confluence with Anthracite Creek, where the North Fork of the Gunnison River commences. Paonia Reservoir manages irrigation water, and has recreation and flood control benefits. The Reservoir bisects portions of parcels 8320 and 8351 and is downgradient from parcel 8140. As noted in **Table 7** and **Section 4.4.7** (Recreation), Paonia Reservoir receives heavy seasonal, including primary human contact with its waters.

In addition to general water quality issues associated with designated uses of area surface waters is the presence of four public water supplies in the general area of, or downstream from, some of the proposed parcels. Two of these are designated by the State of Colorado as Public Water Systems (PWSs), while the other two locally established Source Water Protection Areas (SWPAs):

- Mountain Coal Company LLC / West Elk Mine PWS – A portion of this PWS extends to the edge of the disjunct western portion of Parcel 8351, and the 0.5-mile external buffer established by COGCC Rule 317B extends into the southeastern corner of this part of the parcel. See the discussion of the requirements of Rule 317B, below. The remainder of Parcel 8351 and all of Parcel 8320 are located more than 5 miles upstream from the intake of this PWS and therefore not subject to Rule 317B. Parcel 8140 lies additional 12 or more miles upstream from this PWS.
- Bowie Mine #2 PWS – Parcels 8135 and 8138 are located in the Hubbard Creek drainage approximately 6 to 7 miles upgradient from the Bowie Mine #2 PWS intake. This water is used by the towns of Somerset and Bowie.
- Pitkin Mesa Pipeline Company SWPA – Source waters are a series of springs approximately 3 miles west of Parcel 8138 but in a different drainage sub-basin and not upgradient.

- Hotchkiss SWPA – This SWPA includes the Town's water intake from Laroux Creek via the Highline Canal, Overland Reservoir, and Overland Ditch. The Overland Ditch crosses a portion of the subwatershed that includes Parcels 8135 and 8138, but this segment of the ditch is more than 15 miles upgradient from the two parcels.

As noted above, the Bowie Mine #2 PWS (Identification No. 215202) and the Mountain Coal Company LLC / West Elk Mine PWS (Identification No. 226838) are afforded certain protections under COGCC Rule 317B, which applies different levels of protection based on distance from a PWS watershed boundary. These are an internal buffer of 0 to 300 feet, an intermediate buffer of 301 to 500 feet, and an external buffer zone of 501 to 2,640 feet (0.5 mile). The southeastern corner of the western portion of Parcel 8351, being located within the external buffer of an arm of this PWS, would include the following State-mandated requirements for any drilling, completion, production, and storage (DCPS) activities:

- Use of pitless (closed-loop) drilling systems (these are always used in modern operations) or containment of flowback and stimulation fluids within tanks placed on a well pad or in an area with downgradient perimeter berming, designed and built to strict specifications.
- Collection of baseline water-quality data for analysis of a suite of organic and inorganic parameters specified by the State.
- Notification to the owner/operator of the PWS within 15 stream-miles downstream prior to commencement of surface-disturbing activities and oil and gas operations.
- Preparation of an emergency spill response program that includes employee training, safety, and maintenance provisions and current contact information for downstream PWS(s) located within 15 stream miles downstream.
- In the event of a spill or release, immediate implementation of the emergency response procedures in the emergency spill response program. If a spill or release impacts or threatens to impact a PWS, the operator must immediately report the discovery of the release to the COGCC and the Environmental Release/Incident Report Hotline in accordance with COGCC Rule 906.b.(4). An SPCC Plan is also a BLM requirement (see Section 3.4.14).

In addition to the State Rule 317B requirements, the following stipulations would be applied to a portion of the western part of Parcel 8351 (**Attachments C and D**).

- UFO-NSO-Public Water Supplies – Prohibits surface occupancy or use within 305 meters (1,000 feet) on both sides of a classified surface water-supply stream segment (as measured from the average high high-water mark) for a distance of 5 miles upstream of a public water supply intake classified by the State of Colorado, and within 2,640 feet (0.50 mile) of public water supplies that use a groundwater well or groundwater under the direct influence of surface water. No directional drilling is allowed within 457 vertical meters (1,500 vertical feet) below a surface public water supply or 457 vertical meters (1,500 vertical feet) below the depth of a public water supply that uses a groundwater well or groundwater under the direct influence of surface water.
- UFO-CSU-Public Water Supplies –The BLM may restrict surface occupancy or use, on lands located greater than 305 meters (1,000 feet) but less than 805 meters (2,640 feet) (0.50 mile) of a classified surface water supply stream segment (as measured from the average high-water mark) for a distance of 8.05 kilometers (5 miles) upstream from a public water supply intake classified by the State as a "water supply," and all public water supplies that use a groundwater well or spring. Special design, construction, and implementation measures, including relocation by more than 200 meters (656 feet), may be required. The operator must comply with all applicable sourcewater protection plans developed by public water providers.

An additional potential impact to surface water could occur from decreases in streamflows if surface waters are used as the source of fresh water for drilling, completions, and dust abatement. Although use of fresh water from surface sources is most likely, it is not possible to know at the leasing stage what sources would be used, how much water would be used (dependent on the length of the wellbore, the completions method used, the target formation, and the use of treated and recycled water), and how that use would be distributed relative to streamflows or water levels in the source waterbody. Any use of a surface water source for oil and gas operations would be under a valid water right.

GROUNDWATER

Groundwater resources in the area include Wasatch and Mesaverde sandstone aquifer systems and Quaternary age alluvial aquifer systems. Within the North Fork Gunnison River Basin, the thickness of the Upper Cretaceous aquifers varies from 250 to 4,500 feet. Alluvial aquifers are thickest in valley bottoms but usually less than 100 feet thick. Groundwater in the bedrock aquifers is stated by Ackerman and Brooks (1986) to flow in the direction of general dip of strata, which is approximately 4 degrees to the northeast; however, there is little potentiometric data on Wasatch or Mesaverde intervals, so this is speculative (Ackerman and Brooks 1986). Groundwater flow in the alluvial aquifer along the North Fork Gunnison is generally in the same direction as surface flows in the river (Kolm and van der Heijde 2013).

Domestic water wells and irrigation wells are distributed throughout the general area. These are mostly completed in alluvial or other shallow aquifers because of generally unsuitable water quality in the bedrock units. Approximately 52 domestic wells are currently constructed within 1 mile of the proposed UFO parcels, based on online data available from COGCC.

Environmental Consequences of Leasing and Potential Future Development

Impacts to surface water from oil activities are associated with four potential sources: (1) transport of sediments into surface waters by runoff from areas of surface disturbance; (2) transport of chemical pollutants to surface waters from spills or equipment failures on the well pad or during an accident involving a vehicle or pipeline transporting such chemicals; (3) subsurface movement to surface waters from from pits containing fluids or cuttings stored on the pad and containing hydrocarbons; and (4) movement through the well bore to surface waters subsurface due to improper casing or cementing.

All of these potential sources are the target of restrictions by BLM and COGCC on all phases of the drilling, completion, and long-term production operations. The BLM requires that an additional set of casing, called surface casing, is installed to below the depth of any nearby water wells and, where near a surface water, to below the depth of the surface water. Open pits for flowback fluids containing hydrocarbons are infrequently used under modern operations and, if so, the pits are required to be lined and equipped with a leak detection system. Cuttings trenches are also lined in situations where they could contribute subsurface flow to streams. Remote (radiotelemetric) monitoring of production facilities and containment of all fluid-containing structures within secondary containment capable of containing 110% of the stored capacity—coupled with regular BLM, COGCC, and operator inspections—reduce the potential for releases related to equipment failure and facilitate prompt control. All operators and transporters are required to have an established *Spill Prevention, Containment, and Countermeaures* (SPCC) Plan, including an emergency notification procedure. Temporarily disturbed surfaces are promptly revegetated to reduce erosion potential, and the working surface of the pad that remains open during long-term production must have stormwater controls.

Impacts to groundwater can potentially occur from any incident involving chemical pollutants in surface water that provides recharge to groundwater. However, improperly constructed, cased, or cemented boreholes represent the primary risk of contamination by not adequately isolating aquifers. COGCC Rule 609 requires groundwater sampling in connection with the State-issued APDs. This includes baseline samples and subsequent monitoring samples from up to four sources within 0.5 mile of a proposed oil and gas well, multi-well pad, or disposal well. Initial sampling would occur within 12 months before setting

conductor pipe for the first well on a multi-well pad, or commencement of drilling a dedicated disposal well. Repeat sampling would be conducted at the initial locations between 6 months and 12 months following drilling of the well, and again between 5 years and 6 years following drilling.

To meet COGCC requirements, groundwater samples would be analyzed by a qualified laboratory for major ions (including bromide, calcium, chloride, fluoride, iron, magnesium, manganese, potassium, selenium, sodium, sulfate), trace metals (including barium and strontium), dissolved gases (including ethane, methane, and propane), BTEX, TPH (total petroleum hydrocarbons), alkalinity (total bicarbonate and carbonate as $CaCO_3$), nutrients (including nitrite, nitrate, and phosphorus), and total dissolved solids. Field properties to be measured and recorded include pH and specific conductance. Sampling for QA/QC would include one replicate and one blank during each sampling event.

If free gas or a dissolved methane concentration greater than 1.0 milligram per liter (mg/L) is detected in a groundwater sample, gas compositional analysis and stable isotope analysis of the methane would be performed to determine the gas type (i.e., thermogenic gas associated with fluid minerals, biogenic gas related to bacterial process, or a mixture of the two). Results would be reported to the State and BLM. In addition, the following stipulation would apply to all of the proposed UFO parcels:

- UFO-CSU-Domestic Water Wells – Surface occupancy or use may be restricted on lands located within 305 meters (1,000 feet) of horizontal distance from domestic water wells. Special engineering design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. No directional drilling will be permitted within 457 meters (1,500 feet) of vertical distance below the depth of a domestic water well within a 1,000-foot radius.

POTENTIAL SURFACE WATER AND GROUNDATER IMPACTS FROM HYDRAULIC FRACTURING

The dimensions of induced fractures during hydraulic fracturing during well completions have been measured with field monitoring equipment and in laboratory tests and compared to three-dimensional (3D) models. Researchers have successfully validated these models for fracturing in "tight-gas" reservoirs, including those beginning to be developed in western Colorado. Results of the analyses show that the extent and orientation of fractures resulting from completions of oil and gas wells can be predicted (Zhai and Sharma 2005, Green et al. 2009, Palisch et al. 2012, Ellsworth 2013). Hydraulically induced fracture orientation in relation to the wellbore depends on the downhole environment (i.e., rock mechanics, minimum and maximum principal stress directions, physical rock properties, etc.) and the wellbore trajectory. In vertical or normal directional wells, fracture growth is primarily lateral or outward from the wellbore, with minimal secondary fractures extending at some angle from the lateral fractures.

In horizontal wells such as being used to develop deepwater marine shales (e.g., the Mancos Formation), fracture growth from the wellbore is mainly determined by the orientation of the wellbore in relation to the principal stresses of the rock. Fracture growth toward the surface is limited by barriers such as variations in stress and lithology, as is also the case in vertical and normal directional wells. In some horizontal wells, fracture growth is similar to that in vertical or normal directional wells due to wellbore trajectory along the maximum principal stress direction. Analysis of data from thousands of wells indicates fracture extent (length) of less than 350 feet in the large majority of cases, with outliers of 1,000 to 2,000 feet (Maxwell 2011, Davies et al. 2012) in thick deposits of uniform marine shales.

The potential height of hydraulically induced fractures in horizontal drilling is reduced in layered sediments in which a propagating fracture encounters a change in rock type or a bedding plane within a formation or a contact between formations. When these features are encountered, the fracture either terminates or to a lesser extent reorients along the generally horizontal bedding plane or formation contact instead of continuing upward across it. Advances in horizontal drilling technology have allowed enhanced development of deeper marine shales such as the Mancos Formation. These tight-shale deposits

are typically a few hundreds or thousands of feet thick in western Colorado, compared to many thousands of feet in some other gas-producing regions. The lesser thickness of hydrocarbon-bearing strata in this area limits the vertical growth of primary and secondary fractures from hydraulic stimulation.

Review of available information on microseismic monitoring and fracture dimensions (Fisher and Warpinski 2012, Stone et al. 2016) indicates that fractures from deep horizontal wells are not a threat to propagate across the long vertical distances (thousands of feet) needed to reach freshwater aquifers much closer to the surface. This conclusion applies to much of western Colorado and is applicable to much shallower potable groundwater sources consisting of unconsolidated alluvium (streambed deposits) associated with the Colorado River and major tributaries. In general, domestic and stock water wells in the project vicinity extend to depths of less than 200 feet, with a few from 200 to 500 feet. Impacts to water quality of shallow fresh-water wells are highly improbable as a result of hydraulic fracturing, which occurs at depths of 5,000 to 10,000 feet below ground surface.

In addition to vertical separation between the upper extent of fractures and fresh-water aquifers are requirements by the BLM and COGCC for proper casing and cementing of wellbores to isolate the aquifers penetrated by the bore. The BLM requires that surface casing be set from 500 to 1,500 feet deep, and potentially deeper, based on a geological review of the formations, aquifers, groundwater, and proximity to surface waters. Cement is then pumped into the space between the casing and surrounding rock to prevent fluids from moving up the wellbore and casing annulus and coming in contact with shallow rock layers, including fresh-water aquifers. BLM petroleum engineers review well and cement design and final drilling and cementing logs to ensure properly construction. When penetration of groundwater and freshwater aquifers is anticipated, BLM inspectors may witness the cementing of surface casing and pressure testing to ensure that the space between the casing and borehole wall is sealed.

No single list of chemicals currently used in hydraulic fracturing exists for western Colorado, and the exact combinations and ratios used by operators are typically confidential. However, the general types of compounds and relative amounts are well known and relatively consistent (**Table (8)**. Although a variety of chemicals are used—the examples in **Table 8** being drawn from a total of 59 listed on the FracFocus website—the bulk of fluid injected into the formation during the process is water mixed with sand, representing 99.51% of the total by volume in the typical mixture shown in the table. The sand listed in the table is used as a proppant to help keep the newly formed fractures from closing.

Table 8. Constituents of Typical Hydraulic Fracturing Operations

Additive Type [1]	***Typical Example*** [1]	***Percent by Volume*** [2]	***Function*** [1]	***Common Use of Example Compound***
Acid	Hydrochloric acid	0.123	Dissolves mineral cement in rocks and initiates cracks.	Swimming pool chemical and cleaner
Biocide	Glutaraldehyde	0.001	Eliminates bacteria that produce corrosive/poisonous by-products.	Disinfectant; sterilizer for medical and dental equipment
Breaker	Ammonium persulfate	0.010	Allows delayed breakdown of the gel.	Hair coloring, as a disinfectant, and in manufacture of household plastics
Clay stabilizer	Potassium chloride	0.060	Creates a brine carrier fluid that prohibits fluid interaction with formation clays.	Low-sodium table salt substitutes, medicines, and IV fluids
Corrosion inhibitor	Formic acid	0.002	Prevents corrosion of well casing.	Preservative in livestock feed; lime remover in toilet bowl cleaners
Crosslinker	Borate salts	0.007	Maintains fluid viscosity as temperature increases.	Laundry detergents, hand soaps, and cosmetics
Friction reducer	Polyacrylamide	0.088	“Slicks” the water to minimize friction.	Flocculent in water treatment and manufacture of paper

Additive Type [1]	*Typical Example* [1]	*Percent by Volume* [2]	*Function* [1]	*Common Use of Example Compound*
Gelling agent	Guar gum	0.056	Thickens water to help suspend the sand propping agent.	Thickener, binder, or stabilizer in foods
Iron control	Citric acid	0.004	Prevents precipitation of metal oxides.	Flavoring agent or preservative in foods
Surfactant	Lauryl sulfate	0.085	Increases viscosity of the fluid.	Soaps, shampoos, detergents, and foaming agents
pH adjusting agent	Sodium hydroxide, acetic acid	0.011	Adjusts pH of fluid to maintain effectiveness of other components.	Sodium hydroxide used in soaps, drain cleaners; acetic acid used as chemical reagent, main ingredient of vinegar
Scale inhibitor	Sodium polycarboxylate	0.043	Prevents scale deposits in the pipe.	Dishwashing liquids and other cleaners
Winterizing agent	Ethanol, isopropyl alcohol, methanol	--	Added as necessary as stabilizer, drier, and anti-freezing agent.	Various cosmetic, medicinal, and industrial uses
Total Additives		**0.49**		
Total Water and Sand		**99.51**		

[1] Ground Water Protection Council and the Interstate Oil and Gas Compact Commission 2017.
[2] USDOE 2009.

Following completions, the pressure differential between the formation, with thousands of feet of overlying bedrock, and the borehole, which connects with the surface, causes most of the injected fluids to flow toward the borehole and then upward to the surface along with the hydrocarbon fluids released from the formation. The composition of this mixture, called flowback water, gradually changes as injected fluids migrate back to the wellbore or react with the native rock.

In 2011, the COGCC published an analysis of the use of hydraulic fracturing in Colorado and potential risks to human health and the environment. The introduction to that report includes the following paragraph: "Hydraulic fracturing has occurred in Colorado since 1947. Nearly all active wells in Colorado have been hydraulically fractured. The COGCC serves as first responder to incidents and complaints concerning oil and gas wells, including those related to hydraulic fracturing. To date, the COGCC has not verified any instances of groundwater contaminated by hydraulic fracturing." This statement continues to be true.

Various authors (e.g., Shonkoff et al. 2014) have described the potential for contamination of groundwater via induced fractures, but no such contamination has been demonstrated as a result of normal operations. One case of such contamination, which did not involve normal or appropriate operations, was the subject of a lengthy investigation by the EPA at Pavilion, Wyoming (DiGiulio et al. 2016). In that study, initiated due to presence of oil and related contaminants in a shallow freshwater aquifer and water wells, the EPA found the following: (1) flowback fluids and produced water containing hydrocarbons and high salinity were stored in 33 open pits nearby; (2) the surface casing did not extend below the elevation of the shallow aquifer and deepest water well; (3) no cementing or other bonding was used around the production casing; (4) there was inadequate vertical spacing between the fractured zones and domestic wells. None of these situations would be permitted in Colorado, and severe penalties would be levied against any operator undertaking any of these types of actions.

Based on the information summarized above, the BLM has concluded that use of hydraulic fracturing technology in completions of oil and gas wells to facilitate recovery of Federal fluid minerals does not present a significant risk of impacts to human health and the environment.

Cumulative Impacts of Leasing and Potential Future Development

Cumulative impacts of oil and gas operations on surface water and groundwater resources would result from the past, ongoing, and likely continuing development of Federal leases in the CEAA (**Map (1)**. Because 86% of the CEAA has Federal fluid minerals, of which more than half is currently leased, the risks of operational, equipment-related, or accidental exposure of surface water would also continually increase. This is also the case for potential impact to shallow aquifers used as water-supply wells for domestic, agricultural, municipal uses. However, risks to groundwater, or to surface water through the groundwater route, have a lower potential due to the very tightly controlled actions related to drilling, completing, and producing a wells, and the constraining subsurface infrastructure and bedrock geology.

For surface waters, cumulative impacts can occur both from multiple episodes of releases of contaminants to a single waterbody close enough in time to be additive in terms of impact, or exposures to multiple waterbodies. It is not possible to quantify the risk because of the many factors affecting the likelihood of an event (e.g., the number of wells with a watershed, the miles of associated roads and pipelines used to transport water or liquid condensate, the proximity of pads and roads to surface water, and difficulty of the terrain crossed by haul roads. Because the portion of the CEAA in which existing oil and gas projects have occurred, or have been authorized but not yet permitted and built, is primarily managed by the BLM and/or USFS, it is likely that cumulative impacts would be somewhat lower than if oil and gas projects primarily involved private leases.

Cumulative impacts would also be expected from water depletions due to use of surface waters as sources for drilling, completion, and dust abatement. As described in the discussion above on direct and indirect impacts, it is not possible to know the sources, volumes, or seasonal timing of water used for currently authorized or future oil and gas operations. It also is not known how those would coincide in time (concurrent uses of water) or space (use of water from the same watershed).

3.4.16 Wildlife – Aquatic and Terrestrial, Including BLM Sensitive Species

Affected Environment

The five proposed UFO parcels contain habitat that supports a variety of terrestrial wildlife, and streams that variously support a variety of aquatic species. Some of these species are designated by the BLM as sensitive species, and some birds (including some sensitive species) are protected by Federal laws, including the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. At the leasing stage, the BLM applies NSO, CSU, or TL stipulations based on current mapping available from CPW, particularly regarding critical big game winter range or seasonally critical habitats and seasonally critical habitat for other game species such as large carnivores (black bears and mountain lions) and upland fowl (e.g., wild turkeys). Other stipulations are applied to all or some portions of the parcels based on information available from online and published sources, BLM's corporate GIS data, and familiarity of BLM resource specialists with the areas based on BLM-conducted management activities or oil and gas activities and other developments on nearby lands.

Categories and species of wildlife of particular interest or concern and known or likely to occur within or near the proposed UFO parcels are described below. Also present are small carnivores, including the coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and bobcat (*Lynx rufus*), small herbivores (hares, cottontail rabbits, and rodents), and a small number of reptiles (snakes and lizards) and amphibians (salamanders, toads, frogs, and allies).

Large Ungulates (Deer, Elk, and Moose). Mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus nelsoni*) occur throughout the project region. Area encompassing the lease parcels

include winter range (mostly lower elevations or warmer aspects, generally drier, with less snowcover and with palatable shrubs for browse during winter) and summer range (mostly higher elevations, with more moisture, and often a mosaic of lush meadows and upper montane or subalpine conifers and aspen for hiding and thermal cover). Elk migrate considerable distances both vertically (in elevation) and laterally, while mule deer show smaller movements and often occur in given areas year-round.

Although winter range is widespread through the area of the parcels, areas mapped by CPW as critical winter range (including sensitive winter range and winter concentration areas) for one or both species are less widespread, being limited to parcels 8320 for deer and elk, 8351 and 8390 for elk, and 8140 for moose. Areas intermediate between winter and summer range often support production (elk calving, deer fawning). Elk in particular may concentrate in distinct areas offering ideal conditions for females and the young. No specific calving areas are mapped by CPW in the vicinity of the lease parcels.

The moose (*Alces alces*) is more limited in distribution in Colorado, although locations and numbers have increased markedly in recent years. Within the area of the proposed UFO parcels, CPW noted in its scoping comments that a moose winter concentration area includes parcel 8140.

Upland Gamebirds. Hunting is an important recreational activity in the general area of the proposed UFO parcels. The area is generally too low in elevation for one popular gamebird, the dusky grouse (*Dendragapus obscurus*), but provides high quality habitat for the wild turkey (*Meleagris gallopavo*). This species occurs from foothills through the montane, and sometimes below the foothills zone where habitats are suitable. Turkeys require trees or tall shrubs for cover but often move into nearby meadows or agricultural fields to feed. Diet is varied but emphasizes seasonally available berries, other plant tissues, and invertebrates in summer and in winter shifts to mast (acorns, grain, and pine seeds) when the summertime foods are less available. For this reason, turkeys share with deer and elk a reliance on suitable winter habitats. Also like the ungulates, turkeys tend to congregate where these conditions exist, commonly including Gambel's oak interspersed with pines and junipers, often near grainfields or other agricultural lands. Parcel 8140 is mapped as including a wild turkey winter concentration area.

Birds of Prey. Several raptor species are known or expected to occur within or near the proposed UFO parcels. These include the cliff-nesting golden eagle (*Aquila chrysaetos*), and the tree-nesting bald eagle (*Haliaeetus leucocephalus*), the latter along or near large streams such as Muddy Creek or the North Fork Gunnison River; two large buteo hawks, a small falcon, and a large owl that nest in trees or on cliffs and bluffs (red-tailed hawk, *Buteo jamaicensis*; Swainson's hawk, B. *swainsoni*; American kestrel, *Falco sparverius*; and great horned owl, *Bubo virginiana*); and two smaller accipiter hawks and a similarly sized owl that nest almost exclusively in trees (Cooper's hawk, *Accipiter cooperi*; sharp-shinned hawk, *A. striatus*; and long-eared owl, *Asio otus*).

Also potentially present but less frequently are the cliff-nesting peregrine falcon (*Falco peregrinus*); tree-nesting northern goshawk (*Accipiter gentilis*) and the diminutive northern saw-whet owl (*Aegolius acadicus*) in higher elevation conifers and aspen; and the diminutive flammulated owl (*Psiloscops flammeolus*) and northern pygmy-owl (*Glaucidium gnoma*) in lower and middle elevation conifers, aspen, and Gambel's oak; and osprey (*Pandion haliaeetus*) along Muddy Creek near Paonia Reservoir or the North Fork Gunnison. The bald eagle and northern goshawk are BLM sensitive species; the bald eagle, golden eagle, peregrine falcon, and flammulated owl Birds of Conservation Concern (USFWS 2008).

Other Native Birds. A variety of other native bird species utilize habitats such as those present in or near the five UFO parcels. Some of these are present year-round as resident species, while others are present only in the summer breeding season from late spring through summer. Of the latter group, of particular concern are species that nest in parts of the North America but nest in the New World tropics, called Neotropical migrants. These include species such as hummingbirds, flycatchers, swallows, vireos, warblers, tanagers, grosbeaks, orioles, finches, and New World sparrows, among others.

A few of the small birds known or expected to nest in the general area of some or all of the UFO parcels and listed as BCC species include the resident or short-distance migrant Lewis's woodpecker (*Melanerpes lewis*) in riparian cottonwoods or mixed pinyon-juniper and foothills conifers; the resident or short-distance migrant pinyon jay (*Gymnorhinus cyanocephalus*) in lower elevation pinyon-juniper habitats; Brewer's sparrow (*Spizella breweri*) during summer in large areas of sagebrush; and Cassin's finch (*Haemorhous cassinii*) during summer in higher elevation conifers and during winter in lower elevation conifers or riparian areas). The Brewer's sparrow is a BLM sensitive species.

The purple martin (*Progne subis*), a large species of swallow, nests in nest cavities near the edges of aspen stands. It is not a BCC species or a BLM sensitive species, but it is Forest Service sensitive species known to nest colonially at middle elevations in the general area, and vulnerable to direct or indirect habitat loss due to specific habitat requirements and, being a colonial nester, subject to impacts to multiple pairs in the same small area.

Non-Native Sportfish Species and Native Warmwater Fishes, and Northern Leopard Frog. The final wildlife group of special concern includes non-native trout such as the widely stocked rainbow trout and non-native subspecies or strains of cutthroat trout; two species of native warmwater suckers (bluehead sucker, *Catostomus discobolus*); flannelmouth sucker, *C. latipinnis*); and the northern leopard frog (*Lithobates pipiens*). The two suckers and the leopard frog are BLM sensitive species. The two suckers are known to occur in Hubbard Creek and West Fork Muddy Creek and probably also occur in the North Fork Gunnison River. The leopard frog occurs in slow-flowing streams, ponds, and surface waters within wetlands or wet meadows potentially throughout the area encompassing the lease parcels.

Environmental Consequences of Leasing and Potential Future Development

Impacts to the species groups of terrestrial wildlife described above as a result of potential future development of some or all of the five UFO parcels include direct habitat loss due to habitat removal or modification, indirect habitat loss due to wildlife avoidance of areas of intensive operations (especially construction, drilling, and completions), habitat fragmentation by breaking larger tracts of habitat into smaller tracts as a result of either habitat loss or avoidance, and interference with daily or seasonal movements, including seasonal migrations. The generally lower density of well pads associated with modern types of oil and gas developments in the region—consisting of fewer pads with more wells having longer lateral reaches—would reduce impacts from direct habitat loss or fragmentation and interference with movement patterns of big game ungulates.

A less frequent impact is direct mortality, mostly associated with collisions with project-related vehicular traffic. For aquatic species, potential future impacts include physical loss of habitat such as related to habitat modification along streams, habitat modification or loss in relation to streams and ponds, and changes in water quality due to potential inflow of sediments and chemical pollutants.

Protections for these species provided at the leasing stage include the following stipulations:

- UFO-TL-Big Game Winter Habitat – Prohibits surface occupancy, surface-disturbing activities, and disruptive activities associated with well development in big game severe winter range or winter concentration areas from December 1 through April 15.
- UFO-NSO-Raptor Nest Sites – Prohibits surface occupancy or use within 0.25 mile or 0.5 mile (depending on species) of active raptor nests, or of inactive raptor nests occupied in the previous 5 years and with some or all of the nest remaining.
- UFO-CSU-Raptor Breeding Habitat –The BLM may restrict surface occupancy or use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect nesting habitat during well development activities within 1 mile of nest sites.

- UFO-TL-Raptor Nesting – Prohibits surface occupancy and use associated with well development within 0.25 mile of certain nesting raptors (excluding sensitive species, see below) during species-specific nesting periods.
- UFO-TL-Sensitive Raptor Nesting – Prohibits surface occupancy and use associated with well development within 0.5 mile of active nests of BLM sensitive or other sensitive raptor species during species-specific nesting periods.
- UFO-TL-Wild Turkey – Prohibits surface use in mapped wild turkey winter habitat from December 1 to April 1.
- UFO-NSO-Hydrologic Features – Prohibits surface occupancy or use within 325 from the outer edge of a stream, riparian area, or wetland. This NSO and the associated CSU (below) provide protections for moose concentration areas as well as for aquatic and riparian species.
- UFO-CSU-Hydrologic Features –The BLM may restrict surface occupancy or use, including requiring special design and implementation and potentially relocation by more than 200 meters, within a zone from 325 to 500 feet beyond the outer edge of a stream, riparian area, or wetland.
- UFO-TL-Coldwater Sportfish and Native Warmwater Fish – Prohibits work within any stream segment occupied by these species during the spawning season of April 1 to July 15.
- UFO-LN-Migratory Birds – Alerts the bidder/lessee that migratory birds nest throughout the UFO area from April 1 to July 15 and that operations must comply with the Migratory Bird Treaty Act.

These stipulations and lease notices, in combination with COAs and other mitigations identified at the time of future site-specific NEPA for future oil and gas projects, would avoid or minimize impacts seasonally important or critical habitats and habitat uses by these species of special interest or concern.

Cumulative Impacts of Leasing and Potential Future Development

Because of the protections of the various lease stipulations described above, potential direct and indirect impacts to terrestrial and aquatic wildlife of special interest or concern would be expected to be minor. This is also true for all other Federal projects to which future development of these parcels would be cumulative, and to some degree also true of energy, resource, or land development projects and other activities on private lands. The small area of the five UFO parcels currently proposed for leasing in relation to existing Federal oil and gas leases in the CEAA suggests that the cumulative impacts of these parcels would be small. Similarly, the fact that the CEAA is largely underlain by Federal minerals and has a high percentage of Federal surface (**Table (1)** suggests that future oil and gas projects would have similar protections to those above.

Potential Future Mitigation

Future oil and gas development of some or all of the five UFO parcel would undergo site-specific NEPA analysis and documentation and, if necessary based on biological surveys, other information, and detailed project information. Mitigation measures to be applied to the projects to supplement the lease stipulations and lease notice listed above would include a variety of COAs applied by the BLM to:

- Reduce habitat loss, modification, fragmentation, and interference with migration by careful planning of well pad sizes and locations, such as through clustering and phasing.
- Minimize transport of sediments or chemical pollutants into surface waters to require rapid containment and mitigation of any spills or accidental releases.
- Emphasize pipelines instead of trucks to transport water used or produced by the project.
- Minimize noise impacts from well pads and other surface facilities during long-term operations.
- Minimize the generation of fugitive dust.

- Require prompt and effective reclamation of temporarily disturbed areas using native species.
- Where appropriate for particular species, such as birds with limited suitable nesting habitat and/or that nest colonially (e.g., purple martin, pinyon jay), and for aquatic or wetland sites used for breeding by amphibians (e.g., northern leopard frog, northern chorus frog), establish buffers of up to 200 meters for periods of up to 60 days to preserve the seasonally critical use.

CHAPTER 4 – COORDINATION AND CONSULTATION

During public scoping, the following elected officials and governmental agencies were notified of the proposed lease sale of the five UFO parcels (list continued on following page).

Honorable Michael Bennet
Honorable Cory Gardner
Representative Scott Tipton
State Senate, District 5, Rep. Kerry Donovan
State House of Representatives, District 61, Rep. Millie Hamner
Colorado Dept. of Public Health and Environment
Colorado Dept. of Reclamation, Mining, and Safety
Colorado Div. of Parks and Wildlife
Colorado Oil and Gas Conservation Commission
Delta Co. Board of County Commissioners
Delta County Health Services
GMUG National Forests
Gunnison Co. Board of County Commissioners
Montrose County Public Works
Natural Resources Conservation Service
Navajo Nation
Ouray Co. Board of County Commissioners
Southern Ute Indian Tribe
Town of Crawford
Town of Hotchkiss
Town of Paonia
Town of Ridgway
Uintah & Ouray Tribal Business Committed
U.S. Army Corps of Engineers
USDA-APHIS Wildlife Services
USDI Bureau of Reclamation
USDI Fish and Wildlife Service
USDI National Park Service
U.S. EPA Region 8
Ute Tribe of the Uintah and Ouray Reservation
Ute Indian Tribe
Ute Mountain Ute Tribe
Western Area Power Administration

Table 9. BLM Participants in Preparation or Review of the EA

Name	***Title***	***Resource***
Colorado River Valley Field Office		
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Vanessa Caranese	Geologist	Geology, Groundwater, Paleontology
Allen Crockett, Ph.D.	Supervisory NRS/Phys. Sci.	Project Lead
Faith Dziedzic	GIS Specialist	GIS
Sylvia Ringer	Wildlife Biologist	Fish and Wildlife, Special Status Species
Thane Stranathan	Natural Resource Specialist	Project Co-Lead
Carmia Woolley	Physical Scientist	Air and Climate, Soils, Surface Water
Uncompahgre Field Office		
Amy Carmichael	Assistant Field Manager, Lands and Minerals	UFO Management Team
Ken Holsinger	Ecologist	Vegetation, Special Status Plants
Julie Jackson	Recreation and Transportation	Transportation

Name	*Title*	*Resource*
Greg Larson	Field Manager	UFO Management Team
Neil Perry	Wildlife Biologist	Fish and Wildlife, Special Status Species
David Sinton	GIS Specialist	GIS
Jedd Sondergard	Hydrologist, Planning and Environmental Coordinator	Soil, Water
BLM District and Regional Staff Resources		
Gina Phillips	Planning and Environmental Coordinator, Southwest District	National Environmental Policy Act Compliance
Jessica Montag	Regional Socioeconomics Specialist	Socioeconomics

CHAPTER 5 – REFERENCES

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ATTACHMENTS

Attachment A – All Nominated Parcels with Preliminary Stipulations

Attachment B – Parcels Removed from the Lease Sale

Attachment C – Preferred Alternative Parcels with Final Stipulations for Lease

Attachment D – Stipulation Exhibits

Attachment E – Parcel Maps

Attachment F – Public Comments on the Preliminary EA and BLM Responses

ATTACHMENT A

All Nominated Parcels with Preliminary Stipulations

Attachment A

All Nominated Parcels with Preliminary Stipulations

The Bureau of Land Management (BLM) initially scoped 227 parcels containing 236,016.780 acres in the State of Colorado for oil and gas leasing. These parcels included eight locations containing 7,903.040 acres in the Uncompahgre Field Office (UFO). See Attachment C for the Preferred Alternative Parcels with Final Stipulations for Lease

THE FOLLOWING PUBLIC DOMAIN LANDS ARE SUBJECT TO FILINGS IN THE MANNER SPECIFIED IN THE APPLICABLE PORTIONS OF THE REGULATIONS IN 43 CFR, SUBPART 3120.

PARCEL ID: 8135

T.0120S., R.0910W., 6TH PM
Section 11: Lot 3,4;
Section 11: N2NE;
Section 12: Lot 1-5;
Section 12: W2NE,SENE,NENW;
Section 12: E2SE, SWSE;

Gunnison, Delta County
Colorado 560.540 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COS: UFO

PARCEL ID: 8138

T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: N2,SW,N2SE,SWSE;
Section 11: NWNW;

Delta County
Colorado 763.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COS: UFO

PARCEL ID: 8389

T.0130S., R.0910W., 6TH PM
Section 2: SESW;
Section 3: Lot 4;
Section 3: S2NW,N2SW;
Section 4: Lot 1-4;
Section 4: S2N2,S2;
Section 5: Lot 2-4,9-12;
Section 5: SWNE,S2NW,S2;
Section 6: Lot 1-7;
Section 6: S2NE,SENW,E2SW,SE;
Section 11: NENW;

Delta County
Colorado 2215.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8390

T.0130S., R.0910W., 6TH PM
Section 7: Lot 1-4;
Section 7: E2,E2W2;
Section 8: NE,W2,W2SE;
Section 9: NW,N2SW,NESWSW,SESW;
Section 17: W2NE,NW,N2SW,SESW;
Section 18: Lot 1-4;
Section 18: NE,E2W2,N2SE,SWSE;
Section 18: NWSESE;
Section 19: N2NWNE;

Delta County
Colorado 2491.720 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM;BLM; COS: UFO

PARCEL ID: 8391

T.0130S., R.0920W., 6TH PM
Section 12: Lot 9,15;
Section 13: Lot 1,3-6,11,12;

Delta County
Colorado 365.150 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COS: UFO

PARCEL ID: 8140

T.0110S., R.0900W., 6TH PM
Section 2: Lot 1-5,7,8,11-14;

Gunnison County
Colorado 299.500 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COS: UFO

PARCEL ID: 8320

T.0120S., R.0890W., 6TH PM
Section 28: SENW,SESE;
Section 28: N2SWSE,SESWSE;

Section 33: NENE,SWNW,W2SW;
Section 33: E2SENE,E2E2SE;

Gunnison County
Colorado 330.000 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8351

T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7-9,15;
Section 5: Lot 3,4,9-12;
Section 6: Lot 6-11,14-16;

Gunnison County
Colorado 876.890 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

BLM;PVT/BLM; COS: UFO

Attachment B
Parcels Removed from the Lease Sale

Attachment B

Parcels Removed from the Lease Sale

The Bureau of Land Management (BLM) has determined that the following three UFO parcels were included in the initial public scoping due to administrative error and has dropped these parcels from the December 2018 Competitive Oil and Gas Lease Sale.

PARCEL ID: 8389 (removed)

T.0130S., R.0910W., 6TH PM
Section 2: SESW;
Section 3: Lot 4;
Section 3: S2NW,N2SW;
Section 4: Lot 1-4;
Section 4: S2N2,S2;
Section 5: Lot 2-4,9-12;
Section 5: SWNE,S2NW,S2;
Section 6: Lot 1-7;
Section 6: S2NE,SENW,E2SW,SE;
Section 11: NENW;

Delta County
Colorado 2215.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8390 (removed)

T.0130S., R.0910W., 6TH PM
Section 7: Lot 1-4;
Section 7: E2,E2W2;
Section 8: NE,W2,W2SE;
Section 9: NW,N2SW,NESWSW,SESW;
Section 17: W2NE,NW,N2SW,SESW;
Section 18: Lot 1-4;
Section 18: NE,E2W2,N2SE,SWSE;
Section 18: NWSESE;
Section 19: N2NWNE;

Delta County
Colorado 2491.720 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM;BLM; COS: UFO

PARCEL ID: 8391 (removed)

T.0130S., R.0920W., 6TH PM
Section 12: Lot 9,15;
Section 13: Lot 1,3-6,11,12;

Delta County
Colorado 365.150 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COS: UFO

Attachment C

Preferred Alternative Parcels with Stipulations for Lease

The Bureau of Land Management (BLM) is planning to offer 81 parcels containing 82,863.340 acres in the State of Colorado for oil and gas leasing. The parcels include five locations containing 2,830.55 acres in the Uncompahgre Field Office (UFO). This total includes 1,137.740 acres in Delta County and 1,682.810 acres in Gunnison County.

THE FOLLOWING PUBLIC DOMAIN LANDS ARE SUBJECT TO FILINGS IN THE MANNER SPECIFIED IN THE APPLICABLE PORTIONS OF THE REGULATIONS IN 43 CFR, SUBPART 3120.

PARCEL ID: 8135

T.0120S., R.0910W., 6TH PM
Section 11: Lot 3,4;
Section 11: N2NE;
Section 12: Lot 1-5;
Section 12: W2NE,SENE,NENW;
Section 12: E2SE, SWSE;

Gunnison, Delta County
Colorado 560.540 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Domestic Water Wells to protect domestic water wells

All lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0120S., R.0910W., 6TH PM
Section 11: Lot 3,4;
Section 11: NENE;
Section 12: Lot 1,4,5;
Section 12: W2NE,SENE,NENW;
Section 12: E2SE, SWSE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8138

T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: N2,SW,N2SE,SWSE;
Section 11: NWNW;

Delta County
Colorado 763.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Domestic Water Wells to protect domestic water wells

All lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,W2NW,SENW,NESW,SWSW,NESE,W2SE;

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0120S., R.0910W., 6TH PM
Section 10: W2NE,NW,NESW,W2SE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,NWNW,E2NW,NESW,SWSW,NESE,W2SE;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30-39%:
T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: N2,NESW,SWSW,N2SE,SWSE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,S2NW,N2SE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8140

T.0110S., R.0900W., 6TH PM
Section 2: Lot 1-5,7,8,11-14;

Gunnison County
Colorado 299.500 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect cultural/historical resources

All lands are subject to Exhibit UFO-CSU-Domestic Water Wells to protect domestic water wells

All lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30-39%

All lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range (moose)

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,12-14;

The following lands are subject to Exhibit UFO-NSO-Occupied Dwellings to protect occupied dwellings as defined by the State of Colorado:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 11-14;

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1-4,7,8,11-14;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,11-14;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,13,14;

The following lands are subject to Exhibit UFO-TL-Wild Turkey Winter Use to protect habitat us during the winter season:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 11-13;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8320

T.0120S., R.0890W., 6TH PM
Section 28: SENW,SESE;
Section 28: N2SWSE,SESWSE;
Section 33: NENE,SWNW,W2SW;
Section 33: E2SENE,E2E2SE;

Gunnison County
Colorado 330.000 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Domestic Water Wells to protect domestic water wells

All lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossils

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Scenic Byways to protect visual and scenic values along the West Elk Scenic Byway

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%

All lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0120S., R.0890W., 6TH PM
Section 33: NENE,NESENE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8351

T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7-9,15;
Section 5: Lot 3,4,9-12;
Section 6: Lot 6-11,14-16;

Gunnison County
Colorado 876.890 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Domestic Water Wells to protect domestic water wells

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossils

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Scenic Byways to protect visual and scenic values along the West Elk Scenic Byway

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,10,11;

The following lands are subject to Exhibit UFO-NSO-Occupied Dwellings to protect occupied dwellings as defined by the State of Colorado:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 8;

The following lands are subject to Exhibit UFO-NSO-Public Water Supplies to protect State-classified "water supply" stream segments upstream of a public water supply intake and public water supplies that use a groundwater well or spring:
T.0130S., R.0890W., 6TH PM
Section 6: Lots 15-16;

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7,9,15;
Section 5: Lot 12;
Section 6: Lot 6,8-11,14-16;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-6,10-11;

The following lands are subject to Exhibit UFO-CSU-Public Water Supplies to protect State-classified "water supply" stream segments upstream of a public water supply intake and public water supplies that use a groundwater well or spring:
T.0130S., R.0890W., 6TH PM
Section 6: Lot 9-11,14-16;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 6,7,9,15;

The following lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7,9,15;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,11;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

BLM;PVT/BLM; COS: UFO

Attachment D
Stipulation Exhibits

Lease Number: <LEASE_NUMBER>

Exhibit CO-34

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION STIPULATION

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.

On the lands described below:

<LEGAL_DESCRIPTIONS>

Lease Number: <LEASE_NUMBER>

Exhibit CO-39

CULTURAL RESOURCES

CONTROLLED SURFACE USE

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O.13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

On the lands described below:

Lease Number: <LEASE_NUMBER>

Exhibit CO-56

AIR QUALITY

LEASE NOTICE

Due to potential air quality concerns, supplementary air quality analysis may be required for any proposed development of this lease. This may include preparing a comprehensive emissions inventory, performing air quality modeling, and initiating interagency consultation with affected land managers and air quality regulators to determine potential mitigation options for any predicted significant impacts from the proposed development. Potential mitigation may include limiting the time, place, and pace of any proposed development, as well as providing for the best air quality control technology and/or management practices necessary to achieve area-wide air resource protection objectives. Mitigation measures would be analyzed through the appropriate level of NEPA analysis to determine effectiveness, and will be required or implemented as a permit condition of approval (COA). At a minimum, all projects and permitted uses implemented under this lease will comply with all applicable National Ambient Air Quality Standards and ensure Air Quality Related Values are protected in nearby Class I or Sensitive Class II areas that are afforded additional air quality protection under the Clean Air Act (CAA).

On the lands described below:

<LEGAL_DESCRIPTIONS>

Lease Number: <LEASE_NUMBER>

UFO-NSO-HYDROLOGIC FEATURES

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within 100 meters (325 feet) from the mapped extent of perennial, intermittent, and ephemeral streams; riparian areas, fens and/or wetlands; and water impoundments. For streams, the buffer will be measured from ordinary high-water mark (bank-full stage); for wetland features, the buffer will be measured from the edge of the mapped extent.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To maintain the proper functioning condition, including the vegetation, hydrologic, and geomorphic functionality of wetland features; protect water quality, riparian zones, fens, fish habitat, aquatic habitat; and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least a 30-day period.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least a 30-day period.

Lease Number: <LEASE_NUMBER>

UFO-NSO-NATIVE CUTTHROAT TROUT

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within 325 feet of the edge of the ordinary high-water mark (bank-full stage) of occupied habitat for conservation populations (90 percent pure or greater) of native cutthroat trout.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect core populations and maintain habitat integrity for core populations of species, subspecies, or lineages of cutthroat trout native to the mainstem Colorado and Gunnison River basins.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-OCCUPIED DWELLINGS

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within 305 meters (1,000 feet) of occupied dwellings and building units as defined by the State of Colorado.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect residential developments within unincorporated residential communities and isolated dwellings as defined as occupied by the State of Colorado.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites on the lease.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites on the lease to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-PUBLIC WATER SUPPLIES

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy and use will be allowed within 305 meters (1,000 feet) on both sides of a classified surface water-supply stream segment (as measured from the average high high-water mark) for a distance of 5 miles upstream from a public water supply intake classified by the State of Colorado as a "water supply," and within a 2,640 feet (0.5 mile) buffer of all public water supplies that use a groundwater well or spring. In addition, directional drilling will not allowed within 457 vertical meters (1,500 vertical feet) below a surface public water supply or below the depth of a public water supply that use a groundwater well spring.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect public water supplies, water quality, aquatic habitat, and human health.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-RAPTOR NEST SITES

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within the following areas:

- Bald Eagle and Golden Eagle: Within 0.25 mile of active and inactive nest site or within 100 meters (328 feet) of abandoned nests (i.e., unoccupied for 5 consecutive years) but with all or part of the nest intact
- Northern Goshawk, Ferruginous Hawk, Peregrine Falcon, and Prairie Falcon: within 0.50 mile of active and inactive nest sites
- All Other Raptors (except Mexican spotted owl): Within 0.25 mile of active and inactive nest sites

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect raptor nest sites from placement of long-term or permanent facilities that could prevent future occupation of nests known to have been used, or showing evidence of having been used, within the previous 5 years.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-STEEP SLOPES (>40%)

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed on lands with steep slopes greater than:

- 40%

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To minimize the risk of mass wasting, sedimentation and reduced reclamation costs, protecting soil productivity, rare or sensitive biota, minimizing risk to water bodies, fisheries and aquatic species habitats and protection of human health and safety (from landslides, mass wasting, etc.).

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites on the lease.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites on the lease to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-CULTURAL RESOURCES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted due to historic properties and/or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order13007, or other statutes and executive orders. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Office and tribal consultation) under applicable requirements of the National Historic Preservation Act and other authorities.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect historic properties and/or cultural resources protected under other Federal statues and executive orders.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

The Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

The Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Lease Number: <LEASE_NUMBER>

UFO-CSU-DOMESTIC WATER WELLS

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on lands located within 305 meters (1,000 feet) of domestic water wells. Special engineering design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. No directional drilling will be permitted within 457 vertical meters (1,500 vertical feet) below the depth of a domestic water well within a 1,000-foot radius.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect domestic water wells, associated groundwater resources, and human health.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

The Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

The Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Lease Number: <LEASE_NUMBER>

UFO-CSU-HYDROLOGIC FEATURES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on lands adjacent to perennial, intermittent, and ephemeral streams; riparian areas, fens, and/or wetlands; and water impoundments. For perennial, intermittent, and ephemeral streams, the extent will be measured from ordinary high-water mark (bank-full stage); for wetland features, the buffer will be measured from the edge of the mapped extent. For unmapped wetlands, the vegetation boundary (from which the buffer originates) will be determined in the field. Surface disturbing activities may require special engineering design, construction, and implementation measures, including re-location of operations beyond 200 meters (656 feet) from the extent of water impoundments, streams, riparian areas, and/or wetlands to protect water resources.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To maintain the proper functioning condition, including the vegetation, hydrologic and geomorphic functionality of wetland features. Protect water quality, riparian zones, fens, fish habitat, aquatic habitat, and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-NATIVE CUTTHROAT TROUT

NO SURFACE OCCUPANCY

Stipulation: Special design, implementation, and reclamation measures, including relocation by more than 200 meters, may be required between 325 and 500 feet from occupied habitat for conservation populations (90 percent pure or greater) of native cutthroat trout.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect core populations and maintain habitat integrity for core populations of species, subspecies, or lineages of cutthroat trout native to the mainstem Colorado and Gunnison River basins.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-PALEONTOLOGICAL RESOURCES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted to protect paleontological resources. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. An inventory of paleontological resources may be required before construction and drilling may commence. The BLM Authorized Officer may require that a qualified paleontologist be present to monitor operations during surface disturbing activities.

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To conserve significant and/or relict plant communities with

that are not otherwise protected.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

.Lease Number: <LEASE_NUMBER>

UFO-CSU-PLANT COMMUNITY

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted within occupied habitat that meets BLM's criteria, as established in the RMP, for significant and/or relict plant communities (i.e., Exemplary, Ancient, and Rare Vegetation Communities). Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit a plan of development that would demonstrate that habitat would be preserved to maintain the viability of significant or relict plant communities.

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To conserve significant and/or relict plant communities with

that are not otherwise protected.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-PUBLIC WATER SUPPLIES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on lands located greater than 305 meters (1,000 feet) but less than 805 meters (2,640 feet) (0.50 mile) of a classified surface water supply stream segment (as measured from the average high-water mark) for a distance of 8.05 kilometers (5 miles) upstream of a public water supply intake classified by the State as a "water supply," and all public water supplies that use a groundwater well or spring. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit a coordinated water resources monitoring plan to mitigate potential effects to the source water protection areas of a public water supply. The operator shall comply with all applicable sourcewater protection plans developed by public water providers.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect public water supplies, water quality, aquatic habitat, and human health.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-RAPTOR BREEDING HABITAT

CONTROLLED SURFACE USE

Stipulation: Special design and implementation measures, including relocation by more than 200 meters (656 feet), may be required within 1.0 mile of active nests of raptors (accipiters, buteos, falcons except the American kestrel.

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To prevent or minimize disruption of reproductive activity of raptors during the production period.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least a 30-day period.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least a 30-day period.

Number: <LEASE_NUMBER>

UFO-CSU-SCENIC SCENIC BYWAYS

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted within 805 meters (0.5 mile) of designated scenic byways. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required to protect the scenic (visual) values. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required to protect the following Scenic Byway:

- WEST ELK LOOP SCENIC AND HISTORIC BYWAY

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect the quality of the scenic (visual) values of scenic, historic, or backcountry byways.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least a 30-day period.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least a 30-day period.

Lease Number: <LEASE_NUMBER>

UFO-CSU-STEEP SLOPES (30-39%)

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on steep slopes of 30% to 39%. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit an engineering/reclamation plan to mitigate potential effects to slope stability.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To minimize the risk of mass wasting and sedimentation; reduce reclamation costs; protect soil productivity and rare or sensitive biota; minimize risk to waterbodies, fisheries, and aquatic species habitats; and protect human health and safety (from landslides, mass wasting, etc.).

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-BIG GAME WINTER HABITAT

TIMING LIMITATION

Stipulation: No surface use and surface-disturbing and disruptive activities are allowed during the following time period(s) in big game crucial winter habitat (including severe winter range and/or winter concentration areas) as mapped in the RMP, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies for the following periods:

- Elk, Mule Deer, and Moose: December 1 to April 15
- Pronghorn: January 1 to March 31
- Rocky Mountain and Desert Bighorn Sheep: November 1 to April 15

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To reduce disruption of big game during the winter season in crucial winter habitat.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-COLDWATER SPORTFISH AND NATIVE WARMWATER FISH

TIMING LIMITATION

Stipulation: No in-stream channel work is allowed within occupied fisheries, as mapped in the RMP, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies, for coldwater sportfish (cutthroat trout, rainbow trout, brown trout, and brook trout) and native warmwater fish (flannelmouth sucker, bluehead sucker, and roundtail chub), during the following period:

- APRIL 1 TO JULY 15

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect redds (egg masses) in the gravel and emerging fry of trout and native nongame fish populations.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites on the lease. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites on the lease to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-RAPTOR NESTING

TIMING LIMITATION

Stipulation: No surface use is allowed within a 402-meter (0.25-mile) radius of active raptor nests, as mapped in the Resource Management Plan, BLM's GIS database or other maps provided by local, state, Federal, or Tribal agencies that are accepted by the BLM. This stipulation applies to nests containing eggs or young or being attended by the adults in preparation for nesting, and including partially dilapidated nests known or believed to have been active in the previous 5 years.

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To prevent disruption of reproductive activity of raptors during the production period. This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for a a 30-day period.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review within a 30-day period.

Lease Number: <LEASE_NUMBER>

UFO-TL-SENSITIVE RAPTOR NESTING

TIMING LIMITATION

Stipulation: No surface use is allowed within a 0.5-mile (805-meter) radius of active nests of sensitive raptor nests, as mapped in the Resource Management Plan, BLM's GIS database or other maps provided by local, state, Federal, or Tribal agencies that are accepted by the BLM, during the following time periods, or until fledging and dispersal of young:

- Bald Eagle: November 15 to July 31
- Golden Eagle: December 15 to July 15
- Ferruginous Hawk: February 1 to August 15
- Peregrine and Prairie Falcon: March 15 to July 31
- Northern Goshawk: March 1 to August 31

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To prevent disruption of reproductive activity of raptors during the production period.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-WILD TURKEY WINTER HABITAT

TIMING LIMITATION

Stipulations: No surface use is allowed within wild turkey winter habitat, as mapped in the Resource Management Plan, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies that are analyzed and accepted by the BLM, during the following time period:

- DECEMBER 1 TO APRIL 1

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To prevent disruption of wild turkeys during crucial periods.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or (2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: (1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; (2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or (3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-LN-MIGRATORY BIRDS

LEASE NOTICE

The lessee is hereby notified that prior to and during all lease operations, including development and utilization of oil and gas resources, the lessee must comply year-round with applicable provisions of the Migratory Bird Treaty Act of 1918, 16 U.S.C. §§ 703–712, and other state and local statutes, rules, and regulations now in existence or as may be modified in the future, consistent with lease rights. Migratory birds nest throughout the area of the Uncompahgre Field Office, and seasonal timing restrictions for ground disturbing activities may occur within April 1 to July 15 period of which migratory birds may be nesting in the area.

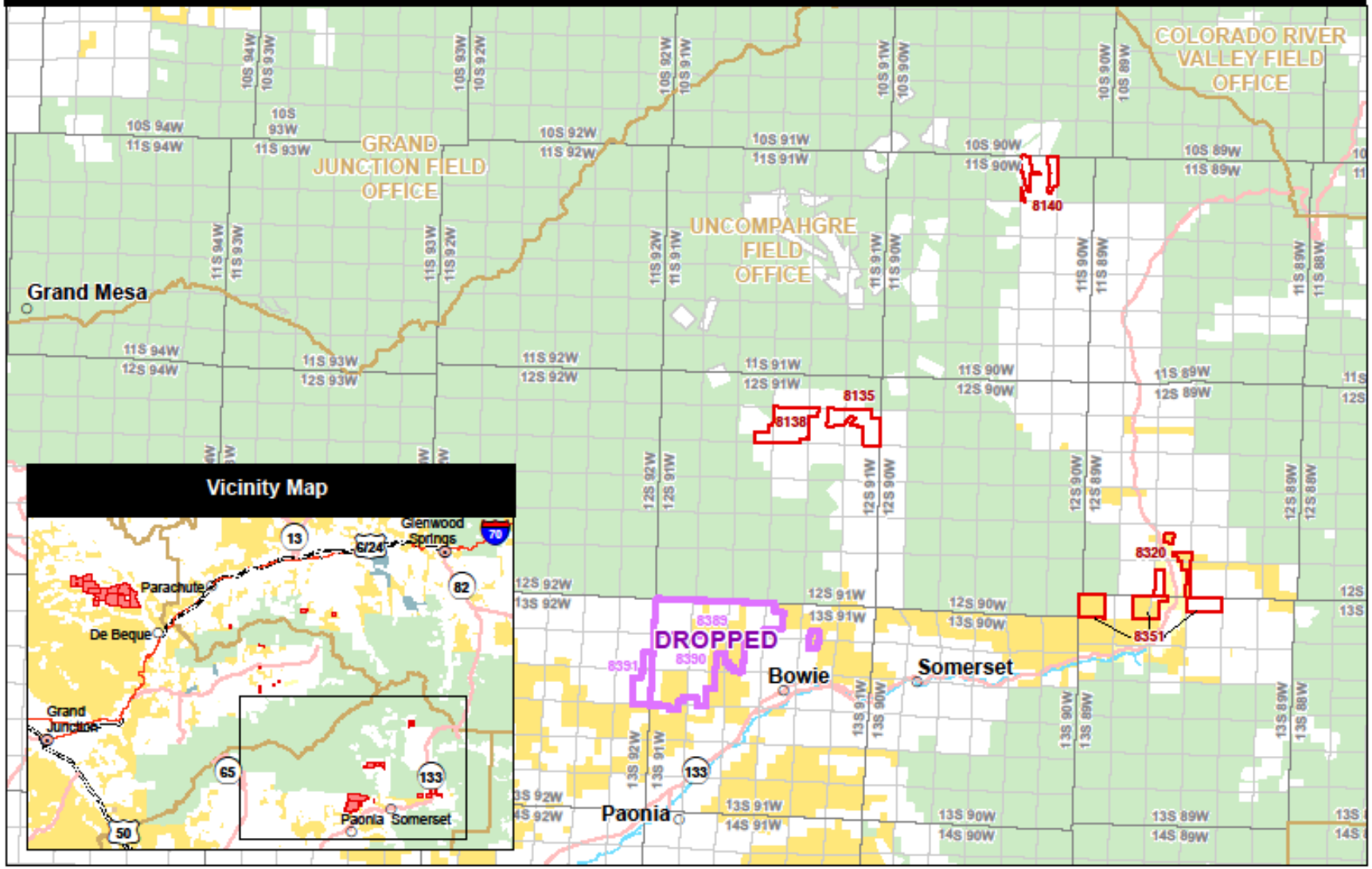
On the following lands:

<LEGAL_DESCRIPTION>

ATTACHMENT E

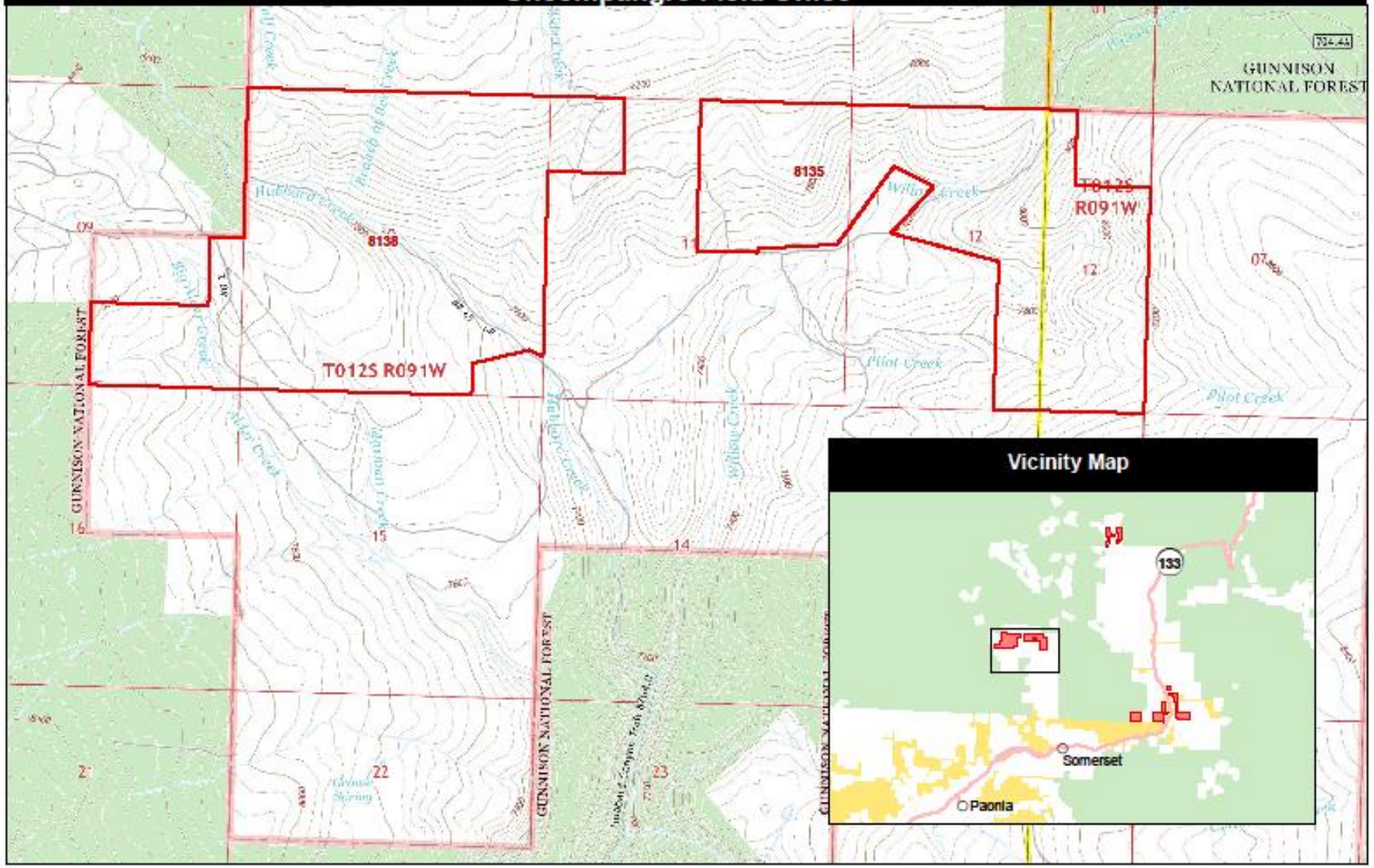
Maps

December 2018 Lease Sale Parcels Uncompahgre Field Office



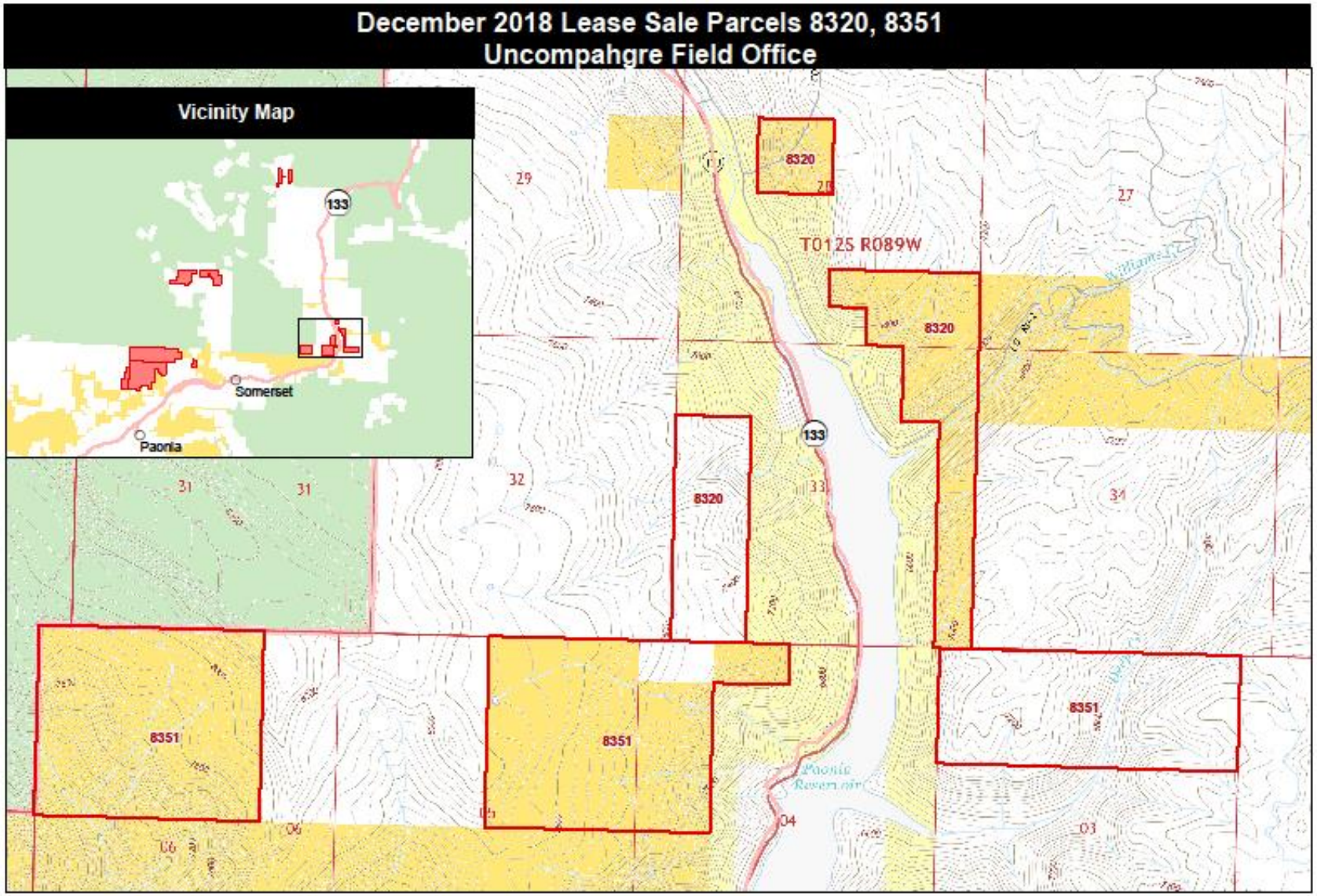
December 2018 Lease Sale Parcels
Deferred Parcels
BLM Field Office Areas Boundaries
Bureau of Land Management
Bureau of Reclamation
Private
US Forest Service

December 2018 Lease Sale Parcels 8135, 8138
Uncompahgre Field Office



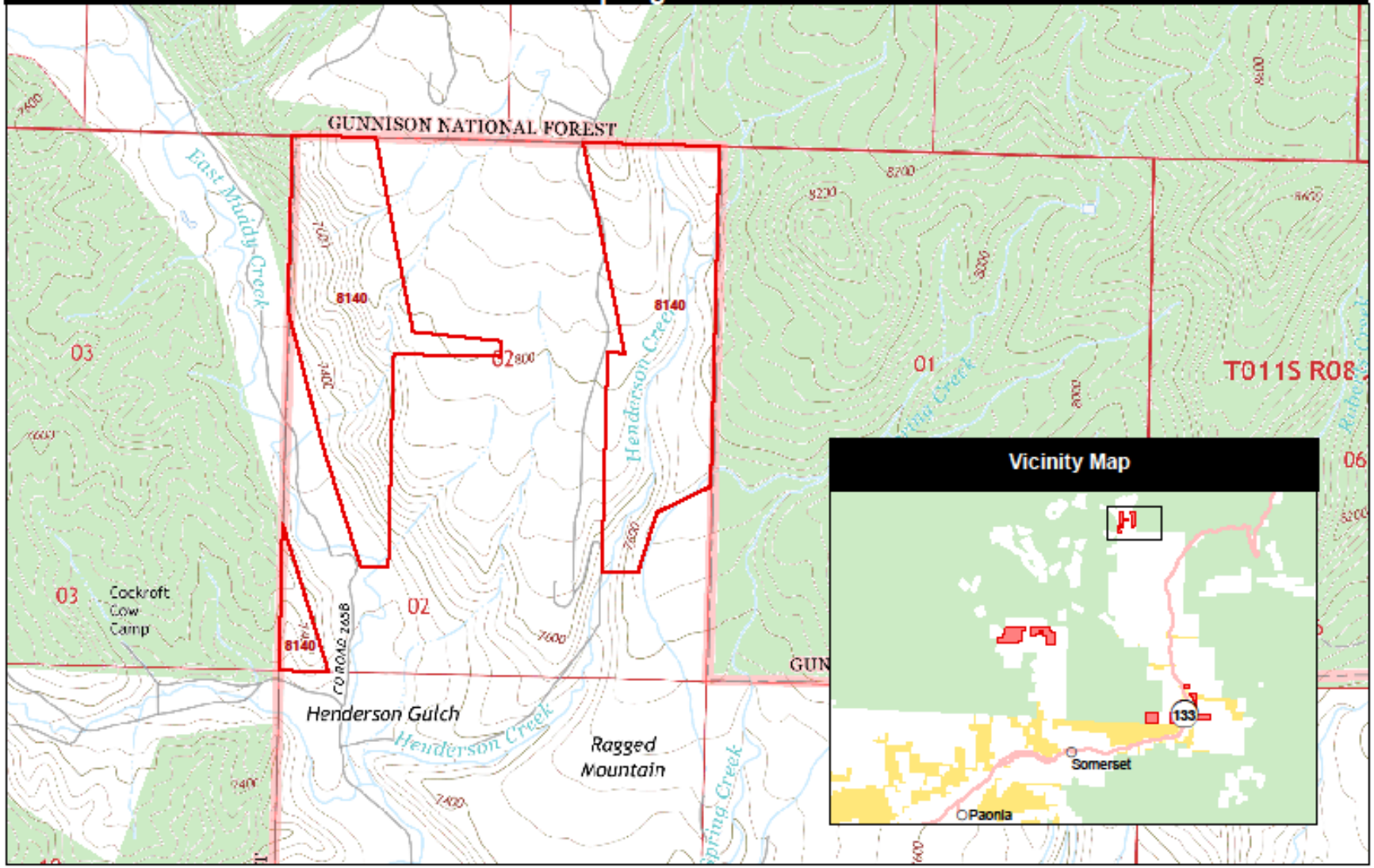
December 2018 Lease Sale Parcels
Private
BLM Field Office Areas Boundaries
US Forest Service

December 2018 Lease Sale Parcels 8320, 8351
Uncompahgre Field Office



December 2018 Lease Sale Parcels
BLM Field Office Areas Boundaries
Bureau of Land Management
Bureau of Reclamation
Private
US Forest Service

December 2018 Lease Sale Parcel 8140
Uncompahgre Field Office



ATTACHMENT F

Summaries of Public Comments on the Preliminary EA and BLM Responses

Table F-1. Lease Stipulations Applied to UFO Parcels

Table F-2. List of Elected Officials and Governmental Commenters

Table F-3. List of Commenters Representing Environmental Groups and Other Organizations

Table F-4. List of Private Individual and Business Commenters

Table F-5. List of Participants on a CHC Form Letter

Table F-6. List of Individuals and Organizations Submitting Scoping Comments

Attachment F

Summary of Public Comments on the Preliminary EA and BLM Responses

INTRODUCTION

The BLM received 393 comments on the Preliminary EA during the public comment period from August 27, 2018, to September 11, 2018. This total included 135 from individuals or businesses, 246 from members of a citizens group, 6 from environmental organizations, and 6 from governmental entities and elected officials. Comments received from the public were reviewed and incorporated as appropriate into the Final EA. Issues and concerns were essentially the same as those raised during scoping, which yielded 357 comments. In a few instances, a scoping comment was resubmitted on the Preliminary EA.

Because the same issues and concerns were expressed throughout the comment submissions, although in various combinations and differing emphasis, the BLM concluded that a synopsis of each category of comment, representing the categories of issues and concerns, would be more helpful than presenting each comment individually. Most of the comment categories presented in this Attachment are organized by resource or resource use to which they refer. Comments from Federal and State agencies, and BLM responses, are presented separately. Also presented separately are a series of comments from the Western Environmental Law Center (WELC), prepared in collaboration with multiple other environmental groups.

Also included in this Attachment is **Table F-1**, presenting a tabular summary of the 20 lease stipulations to be added to some or all of the five UFO parcels evaluated for inclusion in the December 2018 Competitive Oil and Gas Lease Sale. As described in the EA, these stipulations are based on resource information, impact analyses, and public comments associated with UFO's Draft Proposed RMP/Final EIS for the new RMP currently underway.

Tables F-2 through F-5 of this Attachment list names of commenters, consisting of elected officials and government representatives (**F-2**), representatives of environmental groups and other organizations (**F-3**), private individuals and businesses (**F-4**), and participants on a form letter submitted by Citizens for a Healthy Community (CHC) (**F-5**). **Table F-6** lists parties and entities submitting comments during the scoping period. All comments received by the BLM are available for viewing on request.

FEDERAL, STATE, COUNTY, AND LOCAL GOVERNMENT COMMENTS

U.S. SENATE

Letter from the Honorable Michael Bennet to Multiple BLM Recipients

Comment

Many parcels in the proposed lease sale are located in greater sage-grouse habitat or would affect big game winter range and migration corridors. Leasing these parcels would undermine ongoing efforts to improve greater sage grouse habitat, which helped to avoid a listing under the Endangered Species Act by balancing habitat conservation and energy and agricultural development.

Although we understand that the BLM has responded to the State and deferred some parcels, we request that you fully honor the State of Colorado's recommendations at this time and defer all the parcels requested by the state.

BLM Response

Thank you for your participation in this process. None of the parcels in UFO is mapped by Colorado Parks and Wildlife as representing occupied or potential habitat for the greater sage-grouse. Regarding big game, the BLM is aware of CPW's concerns, as expressed in a letter from the Governor, and the BLM has responded to that letter (see below). We believe that protections provided by the big game winter

range Timing Limitation stipulations and the careful planning of future projects, when they arise, to avoid the most critical areas, reduce the number and density of well pads, new access roads, and other surface facilities, and minimize the amount of surface disturbance, and ensure prompt and effective revegetation, weed control, and dust abatement would provide appropriate levels of protection of wildlife and their habitats and movements. The BLM also applies the State's noise standards, including the more protective residential/agricultural/rural zone standard on all parcels. Specific to migration, our review of the scientific literature indicates that the types of pad and road densities typically associated with modern oil and gas projects, with multi-well pads, would allow continued use by big game of historic migration routes.

Comment

The BLM should operate through a fair process with opportunities for widespread community engagement for oil and gas lease sales. To date, Gunnison County and the Town of Paonia have provided recommendations and requests related to the December 2018 lease sale. The Resource Management Plan (RMP) for this region, the Uncompahgre Field Office, is currently undergoing revision with a Final EIS anticipated this fall. As a result, Gunnison County has requested a deferral of all proposed leases in the North Fork Valley until the RMP is completed. They believe that oil and gas leasing should only move forward if it is done in a way that protects the County' s natural resources, public health, safety, and way of life. They also have concerns with the rushed leasing process that results from insufficient public comment periods. Similarly, the Town of Paonia is concerned that these areas are part of the RMP currently under revision and believe it is inappropriate to conduct lease sales under the existing outdated RMP. They also are concerned that the lease sale places their water supply, air quality, and existing economic opportunities at risk.

BLM Response

The BLM believes that the current lease sale process is fair. The public was provided both a scoping comment period and review of the Preliminary EA. Although the periods were relatively short (15 days), BLM received 357 scoping and 393 Preliminary EA comment submissions, many containing multiple specific comments. The basis for considering leasing of the parcels before the new RMP is completed is explained in the EA, specifically in that BLM would apply 20 protective lease stipulations developed and analyzed by UFO resource specialists in the Draft Proposed RMP/Final EIS. BLM believes that the stipulations, in combination with conditions of approval identified through subsequent NEPA review of any future projects, would protect the area's resources, public health and safety, and way of life.

Comment

I am concerned that the BLM's new oil and gas leasing process, set forth on January 21, 2018, in IM 2018-034, is leading to a rushed process for oil and gas leasing in Colorado. Short review periods mandated by the IM de-emphasizes participation by local governments, the public, and the state of Colorado. Transitioning to statewide lease sales places an undue burden on state agencies and other interested parties to provide meaningful review and recommendations for the extensive acreage.

BLM Response

The topic of the relatively short comment periods was touched on above. BLM received numerous comments, despite scoping and comment periods that were shorter than in the past. In addition, many of the issues appeared in multiple comments, suggesting that the time was sufficient for the public and governments to identify their issues and concerns and share them with the BLM.

Comment

BLM Colorado should take additional discretionary steps to inform the public of the status of potential lease parcels and defer parcels that have unacceptable effects on local communities and Colorado's natural resources.

Based on the concerns summarized above, I ask that you defer all of the parcels requested for deferral by the State of Colorado, the Town of Paonia and Gunnison County. Thank you for your attention to this matter and please keep my office informed of any actions taken regarding oil and gas leasing in Colorado and this lease sale.

BLM Response

Comments noted. Thank you for your involvement in the process.

U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)

Submitted Electronically by Melissa McCoy, EPA Region 8

Comment (Air Quality)

The lease parcels proposed for sale within the UFO are located near proposed and ongoing oil and gas development within the North Fork Gunnison sub-basin. This development includes the North Fork Mancos Master Development Plan (NFMMDP) as well as development analyzed in the recent Bull Mountain Unit (BMU) EIS and the EA for Development of 25 Federal Natural Gas Wells and Associated Infrastructure on 5 Multi-well Pads (5 Pad EA). These ongoing and potential projects share common developers and facilities and have relatively concurrent schedules for development.

Because previous BLM air quality modeling predicted that the development in the Bull Mountain Unit could have harmful effects on nearby ecosystems, it is important to evaluate the cumulative effects of the ongoing and potential projects in this geographic area. The Maroon Bells-Snowmass Class I wilderness area is near the ongoing and proposed development and proposed lease sale parcels within the UFO. For the BMU EIS, the BLM conducted quantitative modeling using CALPUFF to supplement statewide CARMMS modeling in order to assess project specific impacts. Nitrogen deposition was modeled since, as indicated in the PEA, deposition at levels below "critical load" thresholds are considered protective of ecosystem health, while levels above the critical load can cause harmful effects including leaching of nutrients from soils, acidification of surface waters, injury to high-elevation vegetation, and changes in nutrient cycling and species composition. Monitored nitrogen deposition at the Gothic monitor is used as an indicator for deposition in the region.

The most recently reported total annual nitrogen deposition (3.07 kg/ha-yr) is above the USFS's identified critical load (2.3 kg/ha-yr). Deposition has worsened over time and now exceeds the level assumed in the BMU EIS analysis, even with limited development of that oil and gas field. This increase in nitrogen deposition emphasizes the importance of managing emissions to achieve Class I area goals in accordance with their statutory mandates. The analysis carried out for the BMU EIS predicted that development of the unit would result in nitrogen deposition significantly above the deposition analysis threshold (DAT) at the Maroon Bells-Snowmass Class I wilderness area. The DAT is the additional amount of nitrogen or sulfur deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant. Therefore, to keep deposition below the DAT and protect the sensitive resources at the Class I wilderness area, the BLM, in consultation with the USFS, applied mitigation in the form of a limit on unit-specific production-phase emissions of NOx. The BMU developers have been authorized to emit NOx up to 143 tons per year (TPY).

Additional development within the same geographic area could allow NOx emissions to exceed that limit and result in nitrogen deposition in excess of what the USFS determined as acceptable for the Maroon Bells-Snowmass Class I area. To address these concerns, the EPA has two recommendations for the

proposed lease sale: (1) We recommend that the cumulative air quality analysis for the EA include emissions from reasonable scenarios for development on the proposed lease sale parcels as well as from NFMMDP, BMU and 5 Pad EA development. We understand that there is a range of possible development scenarios on these parcels; therefore, presenting potential impacts as a range (e.g., low, medium, and high) based on density of development may be appropriate. We recommend that the EA present the resulting impacts at Maroon Bells-Snowmass as well as any other Class I or Sensitive Class II area of concern identified by the BLM or USFS. (2) We recommend that the BLM work with the USFS to determine whether NOx emissions from future development on the proposed lease sale parcels, in addition to emissions from the NFMMDP, BMU and 5 Pad EA, should be kept under the NOx limit deemed appropriate for the BMU. This would appear to be important for achieving Class I area deposition goals.

If potentially significant impacts to sensitive Class I areas are identified, we recommend that the BLM and USFS develop a mitigation strategy that would avoid such effects, or determine whether deferral of leasing would be needed to prevent significant impacts.

The EPA is available to assist in that effort as needed.

BLM Response

As discussed in **Section 3.4.1** of the EA, over the past few years, BLM Colorado has performed three project-level air quality impact assessments (Bull Mountain MDP – 146 wells, Dual Operator Project – 25 wells, and North Fork Mancos MDP – 35 wells [not yet final]) for the area of the proposed lease parcels, including AERMOD / CALPUFF modeling to analyze potential criteria and hazardous air pollutants as well as AQRV impacts. Air quality modeling for those analyses accounted for existing and future projected emissions inventories for the Region. The results for those analyses indicated that each project would not significantly impact air quality and the cumulative pollutant concentrations for the area would be below applicable thresholds with one exception. The air quality impact assessment for the Bull Mountain Unit MDP indicated that the project could impact an AQRV above an acceptable level. To mitigate the potential impact, the BLM and project proponent track new oil and gas emissions for the Unit to ensure that new oil and gas emissions levels for the project development stay at or below emissions levels analyzed in the EIS and identified in the decision.

In addition, the CARMMS 2.0 analysis for existing and reasonably foreseeable development in the area (including the Bull Mountain MDP, Dual Operator Project, and North Fork Mancos MDP plus new potential development) does not predict any significant impacts to visibility, deposition, or ozone. With regard to nitrogen deposition, the CARMMS 2.0 high scenario maximum predicts nitrogen deposition impact from new UFO oil and gas emissions sources is approximately 0.024 kg/ha-yr, which is about two orders of magnitude less than the critical load for nitrogen deposition. Note that this value is likely an overestimate as it would not fully account for additional Bull Mountain MDP mitigation. At this time, new oil and gas development most closely resembles the CARMMS low scenario, which predicts a maximum nitrogen deposition value for all new UFO oil and gas development well below the project-level deposition analysis threshold. BLM Colorado will continue to track oil and gas development within UFO to determine the applicable CARMMS 2.0 scenario and to work with other Federal Land Managers to establish impact thresholds suitable for analyzing potential cumulative impacts.

Comment (Protection of Hydrologic Features)

As stated on the ePlanning website, the BLM has determined that lease stipulations to be analyzed in the EA for the proposed UFO lease parcels, and applied to any leases issued under this EA, would be drawn from the Proposed UFO Resource Management Plan (RMP) instead of the current RMP that was approved in 1989. Accordingly, documents provided on the BLM's website indicate that all lease parcels would be subject to stipulations protective of streams, wetlands, and riparian areas, except for lease sale parcel 8135.

According to the National Hydrography Dataset and National Wetland Inventory data, there are intermittent streams and riverine wetlands on both parcels; therefore, it is not clear why stipulations to protect streams and wetlands are not indicated to be applicable to these parcels. We recommend that these lease parcels be subject to Exhibits UFO-NSO-Hydrologic Features and UFO-CSU-Hydrologic Features. If those streams contain fish seasonally, we also recommend that the parcels be subject to appropriate stipulations for protection of fish habitat and spawning.

BLM Response

The new stipulations are based on the analysis in the Draft Proposed RMP/Final EIS (not the proposed RMP). The BLM reviewed and revised the hydrologic stipulations applied to the lease parcels. Exhibit UFO-NSO-Hydrologic Features and Exhibit UFO-CSU-Hydrologic Features that protect streams, riparian areas, fens or wetlands, and impoundments now apply to lease parcel 8135. Exhibit UFO-NSO-Hydrologic Features does not allow surface occupancy or use within 100 meters (325 feet) from the mapped extent of perennial, intermittent, and ephemeral streams; riparian areas, fens and/or wetlands; and water impoundments.

Exhibit UFO-CSU-Hydrologic Features may restrict surface occupancy or use on lands from 325 to 500 feet outside and adjacent to perennial, intermittent, and ephemeral streams; riparian areas, fens, and/or wetlands; and water impoundments. Surface disturbing activities may require special engineering design, construction, and implementation measures, including relocation of operations beyond 200 meters (656 feet) from the extent of water impoundments, streams, riparian areas, and/or wetlands to protect water resources. Stipulations related to native cutthroat trout and public water supplies do not apply to lease parcel 8135. Three lease parcels (including 8389, 8390, and 8391) were dropped from further consideration due to administrative error. Lease parcels 8140, 8138, 8140, 8320, and 8351 now have both Exhibit UFO-NSO-Hydrologic Features and Exhibit UFO-CSU-Hydrologic Features applied to all lands in order to protect additional hydrologic features beyond perennial streams.

COLORADO DEPARTMENT OF NATURAL RESOURCES (DNR)

Letter from Governor John Hickenlooper to Greg Shoop, Acting BLM Colorado State Director

Comment

In our scoping comments we requested that BLM incorporate a stipulation that limits the density of surface facilities to no greater than one well pad/square mile for specific parcels that contain the highest priority big game winter habitats and migratory corridors. We believe incorporating this stipulation would help satisfy the intent and specific requirements outlined in the Department of the Interior (DOI) Secretarial Order 3362, *Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors,* which directs DOI bureaus to work with States "to enhance and improve the quality of big-game winter range and migration corridor habitat on Federal lands . . ."

BLM Response (Excerpt from Letter by Gregory P. Shoop, Acting State Director, BLM Colorado, to Governor John Hickenlooper)

Your comments related to protecting big game habitat included recommendations to defer parcels in highest priority habitat and migration corridors until BLM field office RMPs are revised, emphasizing consistency with Secretarial Order 3362 to protect wildlife migration corridors and create new stipulations for protecting big game habitat. Timing limitations [identified in UFO's Draft Proposed RMP/Final EIS] and consistent with our current RMPs were applied to parcels within big game winter range and migration corridors. Any reduction of surface disturbance, such as limiting the number of pads in a given area, would be considered when we analyze any proposed lease development.

The current big game leasing stipulations for BLM Colorado's RMPs provide big game habitat protections. Updating oil and gas stipulations that further focus on areas of evolving concern are

considered through the RMP development or amendment processes…. We appreciate our continued partnership with Colorado to identify priority habitat and wildlife corridors so the BLM can minimize impacts while managing public lands for multiple use. I understand CPW is continuing to define the migration corridors of highest interest, and we look forward to working with CPW to identify management prescriptions and potential mitigation.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE)

Letter Submitted Electronically from Sean Hackett, Oil and Gas Liaison, CDPHE

Comment (Air Quality)

Air quality impacts from pollutant emissions are limited by regulations, standards and implementation plans established under the Federal Clean Air Act, as Administered by CDPHE's Air Pollution Control Division (APCD) under authorization of the U.S. Environmental Protection Agency (EPA). APCD is encouraged to see the EA's inclusion of Attachments C and D to alert bidders/lessees of the air quality regulatory process and potential restrictions on their developments to meet Federal and state standards.

APCD recommends that BLM ensure continuous operation of the Paonia High School air quality monitor for at least three complete calendar years to ensure that any oil and gas development in the area is not causing significant air quality impacts in the North Fork Valley and to assess the contribution of future projects on greenhouse gas (GHG) emissions. Additionally, APCD notes that this EA uses Colorado Air Resources Management Modeling Study second iteration (CARMMS 2.0) modeling results. The CARMMS emissions inventories for Eastern Colorado were provided by the BLM to APCD in February 2018. In order to conduct a complete review of the proposed activities, APCD requests a detailed updated emissions inventory for CARMMS in Western Colorado. The inventory must address the impacts of exporting gas in the high development scenario. These impacts include the need for additional gas processing plants and transmission compressor stations, not just production impacts. The emissions should then be modeled in a photochemical model to address ambient air quality effects.

BLM Response

Section 3.4.1 notes that the BLM will continue to monitor air quality for the North Fork Valley as new oil and gas development in the area continues, including continuously operating the air quality monitor at Paonia High School for at least 3 years. In addition, the BLM will provide a detailed updated emissions inventory for the Western Colorado portion of the CARMMS to support analysis of future project proposals.

Comment (Water Quality)

Water quality impacts from pollutant discharges are limited by regulations, standards and classifications established under the Federal Clean Water and Safe Drinking Water Acts, as administered by CDPHE's Water Quality Control Division (WQCD) under authorization of EPA. WQCD recommends that the EA process adequately account for source water protection planning areas (aka: drinking water protection areas) and ensure coordination with local public water providers, local government designees, municipalities and counties to evaluate the protection of public drinking water supplies in the proposed lease areas. WQCD's Source Water Protection Program may also be used as a resource to provide information regarding locally developed source water protection plans. Moreover, the EA process should include evaluation of the leased areas in relation to the Colorado Oil and Gas Conservation Commission (COGCC) Rule 317B Public Water System Protection Areas.

BLM Response

Section 3.4.15 of the EA (Water Quality, Surface Water and Groundwater) includes a description of two State-designated Public Water Systems (PWSs) located downstream from one or more of the five UFO lease parcels. The discussion notes that both PWSs have COGCC Rule 317B protections, and lists the

protective measures and notification measures required by application of Rule 317B. The EA also describes two additional Source Water Protection Areas (SWPAs) in the general area of some of the parcels but notes that both of these SWPAs are either located in different drainages from the parcels or significant distances upstream, or located downstream but consist of ditches diverted from sources significant distances upstream from the parcels.

Comment (North Fork Valley Parcels)

CDPHE understands that the BLM has removed from the December 2018 sale three parcels in Delta County, as well as the parcels under the Paonia Reservoir. However, given continued local concerns, including concerns raised by Gunnison County Commissioners about the adequacy of the analysis conducted in the EA for this lease sale, CDPHE requests that the remaining parcels in the North Fork Valley be deferred from this sale until the draft UFO Resource Management Plan is finalized.

BLM Response

Protective stipulations to be attached to each parcel are shown in Attachment C, described in Attachment D, and presented in Table F-1 in Attachment F. Additional protection, through COAs attached to any individual APDs, would reflect the greater specificity in location, number, and areal extent of surface disturbances and facilities; the timing, rate, and duration of development of each parcel; the resources and uses potentially affected and the magnitude of such impacts; and the mitigations needed to avoid significant adverse impacts.

DELTA COUNTY BOARD OF COUNTY COMMISSIONERS

Letter Signed by C. Douglas Atchley (Chairman), J. Mark Roeber (Vice Chairman), and Don Suppes (Commissioner)

Comment

The Board appreciates the 25 additional stipulations and notices that have been put forward on the lease sale and understands that the requirements are intended to address issues from internal and/or external sources. The Board understands that the BLM will tier this EA to the 1989 Uncompahgre Basin Resource Management Plan (RMP) and stipulations from the Draft RMP/EIS, however there is a general concern with the BLM's legal ability to withstand the eventual litigation of implementing additional stipulations. The Board clearly understands that there has been significant delay in releasing the RMP/EIS as referenced in our April 16, 2012 EA comment letter in which Delta County recommended that BLM consider deferring the August 2012 lease sales until 2013 when the RMP/EIS was expected to be released.

BLM Response

Thank you for your comment.

Comment

The Board is clearly disappointed that the Leases 8389, 8390, and 8391 were pulled from the sale. These three leases are the basis for the proposed pilot project for the North Fork Coal Mine Methane Working Group whose mission is to develop a comprehensive strategy for education, capture, exploration of mitigation, and economic utilization of coal mine methane. These lease sales would have allowed for the utilization of product and continuation of the exploration of viable alternatives. The Board understands that there is no regulatory pathway for such leases; however it was the BLM that indicated this course was a logical approach to address Coal Mine Methane. To continue to switch the goal post and regulatory pathway is frustrating at best and at its worst creates a disincentive to solve issues collectively.

BLM Response

The Interior Board of Land Appeals has found that the fluid minerals leasing process is not the appropriate mechanism for permitting coalmine methane capture. However, BLM's decision to remove the three parcels from the December 2018 lease sale does not mean that the coalmine methane associated with the mines in that area can never be captured for the public benefit. BLM is willing to discuss other processes that could be used to capture that resource.

Comment

The Socio-Economic Impacts portion of this EA did not fully evaluate the impacts and costs to the local communities. NEPA documents going forward must evaluate not only the income side of the balance sheet but the potential impacts as well.

BLM Response

The BLM appreciates the Board's recognition that details regarding impacts to local communities are not readily accomplished at the leasing stage, when the scale, intensity, initiation, and duration of future oil and gas projects is unknown. As the Board has requested, and as would normally be the case, the BLM would provide more detailed projections of impacts during NEPA planning for any future oil and gas projects.

Comment

The Board is in full support of imposing the additional 25 stipulations that were evaluated and narrowed down to the applicable parcels. The Board appreciates that the West Elk Scenic Byway and Delta County Master Plan were referenced in the EA and used in the proposed stipulations. Additionally, the Board acknowledges the reference to the Delta County Master Plan. The year-long public process resulted in a Master Plan that contained the following goal:

> *Goal 7.0-Facilitate responsible, beneficial energy development in order to promote the wise use of natural resources, while also working with energy businesses, land and mineral management agencies, and neighboring county government to eliminate or mitigate , to the extent feasible with in the County's jurisdiction, both on and off site impacts of energy development activities to the environment, water resources, communities, public infrastructure, surrounding land uses, and the public health, safety and welfare within.*

To facilitate this goal, Delta County has convened an Oil and Gas Working Group. The working group is comprised of industry representatives, concerned citizens, and county residents who are evaluating regulations to ensure that Delta County is effectively exercising the authority that is available to a local governing body in order to accomplish Goal 7.0. Proposed recommendations from the Oil and Gas Working Group will be provided to the Delta Board of County Commissioners in the fall of 2018 and these items will be considered for addition to the Delta County Land Use Plan and Specific Development Applications. Delta County will be using this information when project-specific NEPA analysis is proposed for future projects.

BLM Response

Comment noted. Thank you.

Comment

There are numerous existing Federal and private leases in the same area as the proposed lease sales. The Board understands that the majority of the remaining leases is on private lands and respects the rights of private landowners to utilize their land and fluid minerals in cooperation with BLM and numerous other regulatory agencies including Gunnison County. The Board is in full support of the draft RMP/UFO stipulations being placed on the leases.

BLM Response

Thank you for your comment. The final tally of lease stipulations is 20, following dropping of three parcels and the stipulations specific to those parcels.

Comment

The Board would also ask to include that the BLM consider the unknown cumulative offsite impacts caused by increased oil and gas development in or near the County. The support routes within the proposal do not involve Delta County roads; however, the County's maintenance of Forest Service road 265 within Delta County under an agreement with the Forest Service could be affected by the proposed plan. The County would like for any decision on the (EA) to consider the County's involvement in this support road. It is likely that Stevens Gulch Road (similarly maintained) may also be used at times in support of the leases and would also be of concern for the County. The County requests the EA acknowledge and address any impact of the project on these roads even if the ultimate use will be limited.

BLM Response

The BLM currently has no information on which roads would be used, when the use would occur, and the extent to which the roads would need to be upgraded. However, BLM would analyze this issue in detail in the NEPA process for any future oil and gas project.

Comment

The Board supports responsible development of such resources in a manner which respects the BLM's s mandate of multiple use and sustained yield while at the same time protecting the very resources and values that are important to our constituents; clean air, clean water, agriculture, tourism, recreation and a safe and health community for present and future generations.

BLM Response

Thank you for your comments and your participation in the process.

GUNNISON COUNTY BOARD OF COUNTY COMMISSIONERS

Letter from Matthew Hoyt, Esq., Deputy County Attorney, on behalf of the Gunnison County Board of County Commissioners

Comment

For the reasons set forth below, the BOCC urges the BLM to select the "no action" alternative at least as to parcels 8135, 8320, 8351, and 8140 and any other lands within Gunnison County. Deferring any such lease sale until economic conditions for the production and sale coalbed methane natural gas ("CBM") improve and the BLM finishes the process of and adopts an appropriate resource management plan ("RMP") for the lands covered by the proposed sale. The BOCC also reiterates its request that, notwithstanding the inaccurate statements in the Preliminary EA to the contrary, BLM lease stipulations can, and indeed should, include requirements for compliance with Gunnison County land use and environmental regulations.

BLM Response

Thank you for your participation in the process. Separate stipulations requiring compliance with county regulations were not analyzed in the Draft Proposed RMP/Final EIS for the UFO and have not been applied to the parcels for that reason. BLM has applied stipulations to the proposed parcels that it believes will, in combination with site-specific COAs, provide sufficient resource protection.

Comment

As the BOCC has made clear in previous comments submitted to the BLM, the BOCC recognizes that natural gas development is an important part of Colorado's economy and affords economic development opportunities within Gunnison County. Natural gas is a valuable resource that should be extracted in a manner that both permits economic opportunities for the County's citizens and also protects public health, safety, wildlife, tourism and recreation, scenic resources, light, and noise pollution, agricultural uses, water quality, and the environment. Notwithstanding the foregoing, the draft EA, and the process the BLM has undertaken to implement it, are fundamentally flawed. Moreover, the Preliminary EA makes statements suggesting that the BLM disregards Gunnison County's regulatory authority, stake in this process, and input on how the BLM should best proceed with responsible oil and gas development within the County. This, in turn, implies that the BLM views local input as irrelevant with regard to public lands within the UFO. If this is indeed the case, it is contrary to the Secretary of the Interior's commitment to work "with state and local governments, communities, Indian tribes, and other stakeholders as true partners to determine the best ways to accomplish [decisions made in land use plans and environmental reviews], now and into the future." See Bureau of Land Management Press Release, "BLM Requests Input for Future Planning Efforts and Environmental Reviews" (July 3, 2017). It also causes the BOCC great concern about its ongoing and future relationship with the BLM with regard to public lands within Gunnison County.

BLM Response

BLM's intent was not to disregard Gunnison County's regulatory authority, stake in the process, and input on how the BLM should best proceed with responsible oil and gas development, but rather to clarify that County regulations cannot displace Federal regulation of Federal fluid mineral development. As noted in a footnote at the bottom of page 2 of the County's current letter, the BLM does routinely require compliance with applicable local, county, and state regulations (e.g., use of County-designated haul routes, or use of a County-approved disposal facility). However, BLM applies "lease stipulations" that are consistent with the governing RMP or supported by appropriate NEPA analysis, as with the additional stipulations for this lease sale, which are supported by recent UFO analysis in the Draft Proposed RMP/Final EIS.

All of the leases have either Federal surface or private surface underlain by Federal minerals. In both cases, at the point of future development proposals the BLM would be pleased to meet with the County to discuss COAs or project changes that could meet the objectives of specific County ordinances or regulations. BLM's application of COAs is based on site-specific NEPA review of impacts to resources and land uses.

Comment

The BLM did not provide Gunnison County and its citizens a reasonable opportunity for comments.

BLM Response

The topic of the relatively short comment periods was touched on above. BLM received numerous comments, despite scoping and comment periods that were shorter than in the past. In addition, many of the issues appeared in multiple comments, suggesting that the time was sufficient for the public and governments to identify their issues and concerns and share them with the BLM.

Comment

The EA's statement that "Federal lands and minerals" are not subject to Gunnison County regulation is plainly inaccurate.

BLM Response

See response above.

Comment

The Preliminary EA improperly declines to consider the lack of an economic need for additional CBM drilling in the North Fork Basin.

BLM Response

BLM's consideration of lands identified in expressions of interest submitted by members of the public focuses on the impacts of leasing and potential future development of the parcels. BLM's analysis does not include speculation about market conditions during the potential term of a lease, or evaluation of the business decisions of bidders who seek to acquire lease parcels.

Comment

The EA implicitly recognizes but nonetheless rejects the need to adopt a proper RMP before proceeding with the proposed lease sale.

BLM Response

The EA explains, at **Section 2.4** (Plan Conformance Review), the consistency of leasing with the existing plan, and BLM's application of new stipulations based on the UFO's analysis in its Draft Proposed RMP/Final EIS and this EA.

Comment

The BLM did not rigorously explore a No Action Alternative and deferral of the lease sale until adoption of a proper RMP.

BLM Response

BLM considered a no-action alternative as well as the proposed action. This is a sufficient range of alternatives for the decision before the authorized officer. BLM considered the impacts of leasing and potential future development that are reasonably foreseeable at the leasing stage. BLM can perform a more detailed analysis when it receives a site-specific proposal with information about proposed development activity.

Comment

In light of both the comments BOCC previously submitted in this process and the comments contained in this letter, the BOCC does not support the Preliminary EA as written and urges the BLM to adopt the "no action" alternative and defer the proposed December 2018 lease sale.

BLM Response

The County's comments have been noted and are appreciated. Thank you.

TOWN OF PAONIA

Letter from Kenneth D. Knight, Paonia Town Administrator, on behalf of the Mayor of Paonia, the Paonia Board of Trustees, and the Citizens of Paonia

Comment

The EA was supposed to address the issues raised by the public and other coordinating agencies during the scoping period. The fifteen-day comment period for public agencies was nearly impossible to comply with due to Colorado Open Meetings Laws. Additionally, the BLM then failed to account for the scoping comments submitted by the Board of Trustees for the Town of Paonia in the Draft Environmental Assessment. This error has resulted in an Environmental Assessment that does not address the concerns of the community – those most likely to be impacted by the actions the BLM is considering undertaking. These omissions point to a rushed, inadequate, and incomplete analysis.

BLM Response

The Preliminary EA addresses the issues and concerns raised during the scoping process. The various resource-based or use-based sections specifically describe existing conditions, types of impacts, applicable stipulations, and other mitigation measures for direct and indirect impacts, as well as cumulative impacts. The overarching issues of not offering the leases for sale, or of deferring the lease sale until the new UFO RMP is completed, are reflected in the no-action alternative. This is a sufficient range of alternatives for the decision before the authorized officer. BLM considered the impacts of leasing and potential future development that are reasonably foreseeable at the leasing stage. BLM can perform a more detailed analysis when it receives a site-specific proposal with information about proposed development activity.

Comment

As stated in our previous letter, the Town of Paonia is opposed, in general, to the North Fork leases for a variety of reasons which will be detailed below. The Town is also confused as to why a lease sale is being scheduled at this time when the new Resource Management Plan (RMP) for the area is nearing completion. The Draft EA did not address the Town's concern regarding the stale RMP and issues related to the BLM looking to local guidance for public lands decision making. Reviewing these leases under the prior out-of-date RMP seems shortsighted. Simply stated, the Resource Management Plan (RMP) for the Uncompahgre Field Office (UFO) is currently under revision. The field office anticipates releasing the Final EIS this fall, with a Record of Decision (ROD) expected in the spring of 2019. In the draft RMP revision of 2016, the BLM included four alternatives for consideration. Two of the alternatives include consideration of no-leasing, no surface-occupancy, controlled surface occupancy, or other stipulations that would impact these proposed lease parcels and likely make them ineligible for leasing. It had been a longstanding practice in the UFO to not offer new leases while the RMP is being revised. From a policy perspective, this makes sense because any new leases issued during the revision process would prejudice the environmental analysis being conducted. [Additional comment text provided on this topic.] Therefore, the Town strongly advocates waiting until the RMP is finalized prior to moving forward with any lease sales within the UFO.

BLM Response

Leasing is consistent with the land use decisions in the existing RMP (the lease parcels are surrounded by existing Federal oil and gas leases), and the additional stipulations developed by UFO were analyzed in the Draft Proposed RMP/Final EIS and this EA.

Comment

The EA states that the stipulations would rely upon engineering and administrative controls to mitigate impact from hazardous material spills. It does NOT address fire, ambulance, road safety/accident response, or other emergency services within the lease area. The Town foresees a significant impact upon the emergency services agencies within the lease area. No provision for those services are addressed within the EA. The Town would request that the BLM address how natural gas development in this remote area would be covered by local emergency services such as volunteer fire, EMS, and rescue groups.

BLM Response

The EA describes, in **Section 3.4.14** (Wastes, Hazardous or Solid), that all BLM-administered oil and gas projects are required to include a Spill Prevention, Containment, and Countermeasures Plan, which is focused on preventing, rapidly responding to, and fully remediating spill and accidental releases. At the time of individual development projects, it is the responsibility of the operator to work with the nearest town, the specific county, and the state in establishing an emergency notification and communication plan that would apply to fires, injuries, vehicle accidents, etc. BLM can require this as a COA.

Comment

The EA suggests that any seismic activity would be minor and not a threat to any infrastructure, but does not address the consequences of geologic instability that could be dramatically affected by even the smallest of seismic events. The area in question has naturally occurring landslides and instability; manmade seismic events would, most likely, increase the likelihood of additional events. The EA failed to address the study referenced by the Town and simply failed to address the Town's concerns related to fracking induced seismicity.

BLM Response

As explained in **Section 3.4.3** (Geology), the few incidents of seismicity that have damaged roads and structures, mostly in Oklahoma, have been the result of high-pressure, high-volume wastewater disposal wells, and mostly related to disposal into specific geologic conditions (injection into or on top of crystalline basement bedrock). In this region, wastewater disposal wells for oil and gas operations utilize formations thousands of feet above the crystalline basement, including up to 4,000 feet or more of highly impermeable Mancos Shale.

Also as described in the EA, wastewater disposal wells used for the scale of developments that might be typical of future development of the five parcels would be expected to handle much smaller volumes of water. The State regulates disposal wells in Colorado, including the location, injection zone, injection pressure, injection rate, and total disposed volume, specifically to ensure safe operations.

Comment

The Draft EA fails to address the Town's concerns related to sediment runoff and concerns regarding contamination from road accidents. The draft EA relies on stipulations that simply pretend the stipulation will prevent an accident without addressing the very serious issues of what happens when an accident occurs. Surface water is the lifeblood of the Western Slope, and indeed, the entire Colorado River Basin. This proposed development is at the headwaters of the entire basin, which provides domestic drinking water to a total of 40 million people. Immediately within the North Fork of the Gunnison watershed, even small impacts to water quality could have significant health and economic impacts. Any potential for risk of contamination of surface water should be unacceptable. Additionally, sediment is already a major issue for our local water infrastructure. Sediment potential impacts must be better avoided with greater mitigation requirements for all future oil and gas development within the upper North Fork watershed.

BLM Response

The EA describes methods to avoid or minimize soil erosion and transport of sediments to surface waters. This includes an NSO and a CSU for steep slopes, a 100-meter NSO and adjacent 50-meter CSU for streams and other surface waters, and an emphasis during planning to keep pad numbers and sizes to a reasonable minimum and to require prompt revegetation of temporarily disturbed areas. The Colorado, Department of Public Health and Environment regulates the stormwater management designs of all well pads, which are designed as zero-discharge facilities except through the stormwater management components of a pad, which include a settling basin for sediments. Protection of surface waters, including Public Water Systems, is one of BLM's top priorities in project design and oversight.

The EA also mentions the risks associated with use of trucks to haul chemicals, produced water, wastewater, or liquid condensate. The BLM acknowledges this risk but notes that such occurrences are rare and quickly responded to. Also, the big game winter range TL, which precludes construction, drilling, and completion from December 1 to April 15 would greatly reduce travel by heavy trucks and other vehicles during the more difficult travel seasons of winter and early spring.

Comment

The Draft EA does not assess the cumulative impact of this lease sale nor does it address the cumulative impact of this lease sale with previous and potential future development which the RMP EIS would be required to do. The BLM's own modeling of ozone levels in the Bull Mountain area exceed EPA thresholds of 70 ppb. The town could be negatively impacted by additional development in the area that would increase ozone levels beyond this already elevated level, and the BLM should not offer any more leases in such a heavily impacted region. The eventual development of these would exacerbate regional haze issues and other air pollution concerns near National Parks and Recreation Areas related to any potential flaring that might take place, as well as increased dust and particulate matter from increased truck traffic, which could negatively impact the Town of Paonia.

BLM Response

Please refer to BLM's responses to EPA's and CDPHE's comments, above. The EA includes a cumulative impact analysis for each resource- and use-specific section, and Table 1 specifically lists all past, present, and reasonably foreseeable future actions to which possible future development would be cumulative. During preparation of the EA, the BLM Colorado air resources team modeled cumulative air quality impacts based on emissions estimates used for the Bull Mountain EIS, the Dual Operator 5-Pad EA, and the North Fork Mancos Master Development Plan developments operating together cumulatively, with the result being modeled values well below ambient air quality standards—including ozone--and air quality related values associated with Class I and Class II area (National Parks, National Monuments, and Wilderness areas) in the nearby region. **Section 3.4.1** of the EA provides this information in detail.

Comment

Risks to human health from exposure to chemicals associated with oil and gas development including burning eyes, difficulty breathing, cough, nosebleed, anxiety, headache, dizziness and nausea, as well as birth defects, potential development of chronic diseases including damage to cardiovascular, respiratory, immune or endocrine systems. Risk to public health from airborne contaminants, ozone, particulates, VOC's and radioactive particles, as well as contamination of ground and surface water sources must also be considered. Nor does the EA discuss the impacts from noise pollution that negatively affect human quality of life. Given the proximity of this development to Paonia and the potential for negative impacts to human health, the Town would ask the BLM to conduct a Health Impact Assessment as a part of the EIS of the RMP and defer the EA of the proposed lease sale until the completion of said EIS.

BLM Response

The BLM does not perform risk assessments for oil and gas developments but ensures that project are designed and implemented in a manner to be protective of air quality and water quality, to keep noise levels with State of Colorado standards, and to minimize the risk of spills and accidental releases—all described in the EA in detail. BLM is aware of papers cataloging toxic substances used or produced and their effects, and of epidemiological studies and risk assessments suggesting an elevated risk in proximity to oil and gas operations. However, a risk is not the same as an effect, and these papers universally state that cause-and-effect cannot be demonstrated, or that more study is needed. These papers can inform evaluation and refinement of health-based laws and regulations, with which BLM complies.

Comment

Contrary to the Draft EA, legitimate local concerns about the impact from leasing do exist. The following statement from the EA simply does not reflect the opinion of area residents or the Town of Paonia itself: "(b)ased on local experiences, leasing the parcels would not be likely to affect tourism or small - scale farms, including orchards and vineyards, in the North Fork Valley, county government expenditures, or

land values." Oil and gas development is a huge concern for the economic development of organic agriculture, fine wines, and eco-tourism, which are all an important economic driver of the economy of the area. A report published last summer by Citizens for a Healthy Community determined that oil and gas development in the watershed above the Town of Paonia could have significant negative impacts on the North Fork Valley's economy and therefore Delta County's revenue streams. Much of that impact also applies to the Town of Paonia.

BLM Response

The cited statement refers to agribusiness in other areas of western Colorado in which oil and gas development and agriculture continue to exist in relative proximity without demonstrated impacts on agribusiness. The BLM has clarified the basis for the statement in the EA. As explained in the EA, the layers of stipulations, COAs, and operational requirements associated with planning and implementing oil and gas projects, and ongoing inspection or enforcement, would make situations that affect agriculture, agritourism, and ecotourism unlikely. As shown in Table 1 of the EA, large areas of existing leases, some of which have undergone or are undergoing development, already exist both within and outside the multiple Federal oil and gas units in the vicinity. Thus, the EA shows that the proposed new leases would represent a small additional amount of Federal leased acreage (2.7%). BLM has no reason to believe that this small increase in either leased land or, potentially, future development would initiate impacts that have not occurred to date, to the BLM's knowledge.

Comment

In the EA, the BLM failed to consider the Town's concerns about traffic impacts to the roadways, access routes, nearby residents, wildlife, ditch water contamination, and all communities that will be affected by this large oil and gas proposal. A single well can require thousands of truck trips on Federal, state, and county roadways that were not designed for that size and frequency. Colorado Highway 133 already poses significant risk for travelers due to the treacherous climate, geology, and isolated location. What are the safety and infrastructure impacts to our highways? Who is going to pay for an upgrade to that public infrastructure?

BLM Response

The EA discusses traffic impacts, in general, but more detailed analysis is not possible at the leasing stage, when the exact locations, scale, intensity, method, timing, and duration are unknown, as are factors such as amount and source of water to be used, whether it would be moved by truck, pipeline, or some combination. This information would be compiled and analyzed as part of the NEPA process for any future development proposal.

Comment

The EA failed to address our local concerns for wildlife. Of particular concern are impacts to mule deer, elk, Canada lynx, yellow-billed cuckoo, bald eagle, and greenback cutthroat trout. This lease sale, coupled with the impacts of immediately surrounding energy development proposals, threaten this rare interconnected habitat and its wildlife. It is imperative that the BLM consider different alternatives (and fewer well pads) to fully explore alternatives that would decrease the negative impacts to wildlife-especially big game.

The state currently does not possess adequate data on elk and mule deer populations in the area of the proposed development, and local CPW staff indicate that recent elk population numbers in the area have been in steep decline over the last few years. The local elk and mule deer are essential to the local economy, not to mention the ecology of our landscapes.

BLM Response

The EA addresses aquatic and terrestrial wildlife in detail in **Sections 3.4.10 and 3.4.16**, and BLM applied a variety of stipulations specifically to avoid or minimize impacts to big game, raptors (including the bald eagle and northern goshawk), the yellow-billed cuckoo and other small birds, the native cutthroat trout and native nongame species, and the wild turkey. Also as indicated in the EA, any specific occurrences of areas of high value wildlife use would be addressed through COAs under BLM's regulatory authority (e.g., protecting sites used for breeding by amphibian species). The BLM always strives toward the fewest pads possible, which become increasingly achievable due to advances in drilling and completion technologies and associated multiwell pads, long-reach horizontal wells, or both.

Comment

With all due respect to the hard working employees of the BLM, the failure to include the Town's concerns from our scoping letter and the inadequate nature of the Draft EA requires the Town to, once again, request that this lease sale be postponed or cancelled until after the Uncompahgre Field Office Final Environmental Impact Study is completed and the public has had the opportunity to provide input into the final report.

BLM Response

We appreciate the Town's comments. The BLM apologizes to the Town for inadvertently failing to initially include its comment letter in the tally of scoping comments. BLM did review and consider the Town's scoping comments during preparation of the Preliminary EA and the Final EA. We also apologize to some businesses and individuals whose scoping comments, while received and reviewed, were not acknowledged in Attachment F to the Preliminary EA. We believe that Tables F-2 through F-5 are complete lists of commenters during the two 15-day public reviews.

SUMMARIES OF COMMENTS RECEIVED FROM INDIVIDUALS AND BUSINESSES, BY TOPIC

Air Quality and Climate Change

Stated Concerns

Concerns from private individuals and representatives of businesses and local and county governments were mostly related to emissions of methane and chemical pollutants associated with drilling, completion (hydraulic fracturing), and production of fluid mineral resources, including formation of ozone as a result of some of these emissions. The focus of the concern expressed was on potential impacts on human health (addressed as a separate category, below), and only secondarily on potential impacts to air quality related values such as visibility in relation to the scenic quality and scenery-based tourism of the area.

BLM Response

As noted in **Section 3.4.1** (Air Quality and Climate Change), all lease parcels in Colorado are subject to Lease Notice CO-56 to ensure that future oil and gas projects do not significantly affect air quality, and to assess the contribution of future projects on greenhouse gas (GHG) emissions. This Lease Notice alerts bidders/lessees of BLM Colorado's air quality protection process and potential restrictions on developments to meet National and State standards and protect Air Quality Related Values (AQRVs).

Section 3.4.1 of the EA provides detail on the Comprehensive Air Resource Protection Protocol (CARPP), under which the BLM performs air quality analyses for proposed oil and gas developments in order to complete the appropriate level of NEPA analysis and to track emissions statewide. An emissions inventory would be generated for each APD using data provided by the proponent.

Also as described in **Section 3.4.1**, the portion of the North Fork Valley in which the five UFO parcels are located is within the Central Mountains and Western Slope regions for air quality planning (Colorado

Department of Public Health and Environment [CDPHE] 2017). The most representative monitored regional background concentrations available for criteria pollutants (CDPHE 2017) indicate that all background concentrations are below the levels of the National Ambient Air Quality Standards (NAAQS) and Colorado Ambient Air Quality Standards (CAAQS). In addition to health-based regulatory standards, the Prevention of Significant Deterioration (PSD) program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined baseline level. This program applies to PSD Class I and sensitive Class II areas such as Wilderness areas, National Parks, and National Monuments within 200 kilometers (km). As part of the Interagency Monitoring of Protected Visual Environments (IMPROVE) program, continuous visibility-related optical background data have been collected at the Flat Tops, Maroon Bells-Snowmass, and Weminuche wilderness areas. These data indicate that the average standard visual range (SVR) at each site has increased from greater than 150 km historically to 200 km in the most recent reported years (IMPROVE 2017).

Based on the project-specific emissions inventory and modeling, future oil and gas projects involving the UFO parcels may be subject to changes in project design and schedule as needed to ensure the estimated emissions and modeled air quality impacts conform with applicable standards and acceptable levels. Examples include using equipment with lower emissions rates, limiting the well development rate in a general area (number of drilling rigs and/or completion operations at a given time), adjusting the well development schedule to specific seasons, altering concurrent well development in a general area (e.g., simultaneous well drilling and completion at one location or multiple proximate locations).

Cultural Resources and Native American Religious Concerns

Stated Concerns

The few comments about cultural resources focused on the importance of consultation with the Native American Indian Tribes.

BLM Response

As noted in **Section 3.4.2** of the EA, the North Fork area is historically known as part of the Ute Tribe homelands, and such areas may contain Traditional Cultural Properties, culturally sensitive areas and landscapes, and areas of special concern to the modern-day Ute Tribes. Tribal consultation letters for the proposed lease sale were mailed to Tribal representatives of the Ute Indian Tribe of the Uintah & Ouray Reservation, the Southern Ute Indian Tribe, the Ute Mountain Ute Tribe, and the Navajo Tribe. These tribal representatives were asked to provide any information they may have regarding culturally sensitive areas and landscapes within or near the five parcels. Tribal involvement would be anticipated during planning for subsequent project implementation NEPA assessment, when more specific information would be available from detailed cultural surveys in proximity to areas of surface disturbance and the placement of facilities. The Tribal representatives would be invited to visit the sites to better inform them of aspects of site qualities that may have special significance and warrant special protection under BLM's regulatory authority as COAs.

Also as noted in **Section 3.4.2** of the EA, potential bidders/lessees would be alerted by Exhibit CO-39 on each lease about the need for cultural resource surveys at the time of any future oil and gas projects and that results of the surveys could limit their development. In addition, all leases would have stipulation UFO-CSU-Cultural Resources restricting surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect eligible or potentially eligible cultural resources.

Geologic Hazards: Slope Instability

Stated Concerns

The well-known geologic (slope) instability of the area, with historic and active landslides and rockfall areas, was an issue expressed by many commenters. This situation is not unique to the proposed lease area, although the State has ranked the State Highway 133 corridor as the second most unstable corridor in Colorado. Although some comments mentioned the risk this naturally instability would potentially pose to oil and gas facilities, or to travelers on area roadways, more of the concern involved potential impacts of resultant increased sediment loads and waterborne pollutants on water quality of Muddy Creek, Paonia Reservoir, and the North Fork Gunnison River, and of irrigation waters and public water systems associated with the reservoir and river.

BLM Response

As indicated in **Section 3.4.3** of the EA, the BLM is aware of slope instability issues related to the steeply dissected terrain in parts of the leasing area and the type of bedrock and unconsolidated materials on steep hillside, stream valley sideslopes, roadcuts, and areas of historic slope failure. The BLM has included some additional information on this topic in the body of the EA. The EA also describes stipulations and other measures to be applied to future projects to ensure stable locations and alignments. Although known or potentially unstable slopes are common in the area, the BLM has concluded that all of the parcels contain potentially suitable locations for surface operations. In addition, the lateral reach available with modern drilling methods would make it possible to develop parts or all of the parcels from off-lease areas if suitable on-lease locations cannot be satisfactorily addressed during planning of future projects.

Geologic Hazards: Induced Seismicity

Stated Concerns

Many comments mentioned concerns about induced seismicity associated with hydraulic fracturing operations as a possible triggering event for a landslide or rockfall or, as stated in the comments, potential structural damage to or failure of Paonia Dam, with catastrophic downstream consequences.

BLM Response

As described in **Section 3.4.3** of the EA, the process of hydraulic fracturing (fracing) during well completions results in the inducement of microseismicity due to pressures generated that result in fracturing of the surrounding bedrock as a method to enhance recovery of hydrocarbons. These microseismic events are normally not detectable at the surface (except by geophysical instruments) or, if felt, are not of a magnitude to cause damage to structures or to trigger slope failure. Also as described in the EA, with very few exceptions the incidence of felt earthquakes is not related to hydraulic fracturing but to disposal of flowback fluids and produced water in deep disposal wells injecting larger volumes, at higher pressures and rates, than expected to accompany future development here. Both Federal and private disposal wells in Colorado are regulated by the Colorado Oil and Gas Conservation Commission, under its delegated authority from the EPA, with regard to location, injection depth, injection pressure, injection rate, and total injected volume. The restrictions are specifically intended to avoid or minimize the risk of felt earthquakes, and of earthquake-related damage.

Human Health

Stated Concerns

Some comments focused on human health concerns, primarily through the pathways of potential airborne or waterborne transport from oil and gas facilities, and to a lesser extent from direct exposures related to spills and accidental releases. Comments on air quality frequently also addressed concerns about the

contribution of future oil and gas development of UFO parcels to climate change. These potential sources of contaminant transport into the human and natural environments are addressed in detail in the EA in **Sections 3.4.1** (Air Quality and Climate Change), 3.4.14 (Wastes, Hazardous or Solid), and 3.4.15 (Water Quality, Surface Water and Groundwater). The third of these three cited sections includes discussions related to the protection of Public Water Systems and other water supplies, and to the protection of usable groundwater and water wells in connection with drilling, hydraulic fracturing, and wastewater disposal wells. The analogous portions of this Attachment also address these topics.

Some comment letters presented specific citations, or PDF copies, of articles and published papers related to human health in relation to oil and gas developments.

BLM Responses

The types of investigations fall into the types summarized below.

Case Studies of Specific Spills or Releases describe specific instances of direct exposure, such as from a documented chemical spill or release, mostly resulting from improper equipment or operations, in turn leading to regulatory action and/or litigation (e.g., Bamberger and Oswald 2012, 2015). See the discussion of these papers in the section on Ranching and Livestock Management in this Attachment.

A study by the EPA in Wyoming (DiGiulio and Jackson 2016) concluded that contamination of a shallow aquifer and water wells resulted from a combination of (1) numerous surface pits used to hold flowback water from the oil and gas wells, (2) failure to install surface casing around the well bore to a depth below the shallow freshwater aquifer, (3) failure to install cement outside the production casing, and (4) inadequate vertical separation of the fractured zone and the Underground Source of Drinking Water (USDW).

Hazard Assessments (e.g., Colborn et al. 2011, Shonkoff et al. 2014, Werner et al. 2014, Carpenter 2016, Hays and Shonkoff 2016, Webb et al. 2016, and Payne et al. 2017) focus on identifying and describing human health impacts associated with exposure to certain chemicals used in or produced by developments. These studies do not demonstrate that such exposures occur, or at what levels, or with what effects, but they do demonstrate that use or production of toxic chemicals carries some risk of adverse health impacts on human populations that are exposed.

Epidemiological Studies typically use medical data, such as hospital or inpatient databases, to look for positive correlations—and to analyze those correlations statistically—in relation to proximity to oil and gas wells, or number of wells within varying distances. Examples include McKenzie et al. (2014), who compared rates of three categories of birth defects to three spatial categories well proximity and distance, using locations where the mothers lived at the time of the birth. Their study, in a rural area of western Colorado, showed a significantly greater risk of congenital heart defect rates based on well distance and well density, and of neurological defect rates for the closest/densest well category but not the categories with more distant wells and lower densities. The authors noted their inability to adjust the data for all of the other variables that they would like, especially for neurological defects (due to very low numbers), although for the cardiovascular defects they did adjust for ethnicity (Hispanic/non-Hispanic, smoking yes/no, alcohol consumption yes/no, infant's sex, premature birth, and birth weight). After publication of the paper, the Chief Medical Officer of the Colorado Department of Public Health and Environment advised the public that the study had several shortcomings, stating "Many factors known to contribute to birth defects were ignored in this study" and that pregnant women or new mothers should not be alarmed by the reported findings.

Another epidemiological study by Jemietta et al. (2015), in relation to the rapid increase in oil and gas activity in Pennsylvania, used inpatient discharge records in comparison to the rate of new well development and well densities based on 25 zip codes in three counties. The authors reported a statistically significant relationship between cardiovascular issues and new well rates, and between neurological issues and total well numbers.

Risk Assessments are less frequent, in part because they would normally examine the risks of exposure to certain chemicals, from certain sources, at certain rates, via certain complete exposure pathways, and the vulnerability of the receptor populations. A risk assessment approach was undertaken by McKenzie et al. (2012), also in western Colorado. The risk assessment used a combination of a fixed monitor in the middle of a residential area and at the perimeters of four well pads and placed 130 to 500 feet from the pad centers during well completions. Risks were estimated for receptors less than and greater than 0.5 mile from the nearest well pad. The authors assumed 5 years to develop all wells on the pad, and 20 to 30 years of production. The risk analysis showed that the non-cancer risk is greater for residents closer to the wells and during the development phase. The cancer risk was also calculated as being higher for the area closer to the wells, based on benzene. It should be noted, however, that the samples collected at the pad perimeters were taken "during uncontrolled flowback into tanks venting directly to the air," an unusual situation that likely greatly exaggerated the source concentrations. Shortly after its publication, the study was challenged by the Colorado Oil and Gas Association (COGA) based on the sample collection method, newer regulations that would have precluded the operations being conducted at the time of sampling, a 5-year duration (versus 1 year) to complete a typical multi-well pad, and reporting risk levels that are lower than acceptable risk levels established by the EPA.

Studies of Ambient Concentrations of Oil and Gas Pollutants in Specific Areas describe how increases in oil and gas activities in an area can lead to increases in certain atmospheric pollutants. An example is the paper by Thompson et al. (2014), which reported on increases in primary emissions of non-methane hydrocarbons, and of ozone (formed by chemical reactions of certain compounds in the atmosphere) in the Erie/Longmont area of the Northern Front Range due to expansion of oil and gas development in the nearby Wattenburg Field of the Denver-Julesburg Basin, made possible by the advent of horizontal drilling and more advance hydraulic fracturing technologies. They used chemical signatures to differentiate between oil-and-gas-related pollutants in their study area and some of the same compounds (particularly benzene and toluene) that are elevated in the Denver area due to vehicle emissions associated with the highly urbanized and rapidly growing population. The authors concluded that, "Benzene levels in both Platteville [in the Wattenburg Field] and Erie/Longmont could be detrimental to human health if chronic lifetime exposures should occur."

A similar study in Pennsylvania (Swarthout et al. 2015) accompanied the rapid increase in development associated with the Marcellus Shale. This study documented increases in volatile organic compounds (VOCs) typical of those associated with oil and gas emissions, and potential formation of ozone. The authors did not address whether these represented exceedances of national or state standards, nor did they attempt to correlate their findings to any human health effects.

Summary Response

The BLM acknowledges that toxic chemicals are used, produced, stored, and transported during oil and gas operations. However, as described in the EA and comment responses, a myriad of BLM and State of Colorado policies and regulations, and COAs applied to specific Applications for Permit to Drill, are specifically intended to prevent exposures of these chemicals to humans or the environment. The studies by Bamberger and Oswald (2012) in Pennsylvania and DiGuilio and Jackson (2016) in Wyoming highlight situations that were improper and impermissible at the time. The study by McKenzie et al. (2012) collected samples during an activity that was allowed at the time but is no longer.

The BLM understands the air quality issues related to oil and gas activities, including in connection with the longer well bores and more powerful engines associated with drilling and completing horizontal wells in deep, tight shale formations. In recognition of the importance of ensuring continued protection of air quality for human health and certain environmental qualities (e.g., impacts to visibility and acid deposition), BLM Colorado developed the CARPP process. This process, as described in Section 3.4.1 and the BLM Response to EPA's comment on the Preliminary EA, above, includes compilation of air

emissions inventories and use of predictive modeling through the CARMSS to analyze and protect air quality and air-quality related values through adaptive management.

For both air quality and water quality, and other potential exposure routes to human and natural receptors, BLM Colorado and the various Field Offices are responsible for ensuring that future development projects are implemented in accordance with applicable State and Federal regulations, including regulations that may be adopted in the future. In addition to those laws, the stipulations attached to the five UFO parcels, and the design features, operational requirements, and mitigation measures to be applied at the time of future lease developments, provide the necessary and appropriate protection of human health.

Noise

Stated Concerns

The few comments mentioning noise did so primarily in the context on impacts to quality of life in the currently low-density "pastoral" or "bucolic" landscape surrounding the parcels and much of the North Fork Valley. Noise was also mentioned relative to impacts on wildlife (see comment responses related to that resource).

BLM Response

Section 3.4.4 of the EA describes in detail the types of noise, and estimated noise levels, typically associated with oil and gas activities, and the fact that noise is greatest during construction, drilling, and completions—due both to activities associated with the pad and heavy truck traffic along access roads—but diminishes dramatically when those activities are completed. The text in the EA also notes that long-term production operations must comply with State noise standards, and that the BLM requires compliance with the Residential/Agricultural/Rural zone, even if no houses are located nearby. The more stringent requirement applied by the BLM is intended to help preserve more of the currently low ambient noise levels where the parcels are located, benefitting residents, visitors, hunters and other recreational travelers, and wildlife.

Ranching and Livestock Management

Stated Concerns

A few comments were submitted on this topic, primarily regarding potential for harm to livestock from exposure to toxic chemicals.

Response

Sections of the EA dealing with Water Quality (**Section 3.4.15**) and Wastes (**3.4.14**) address the subject of risks and mitigations related to protection of surface waters, some of which are also used for irrigation or stock watering. **Section 3.4.6** deals specifically with other types of impacts to ranching operations, such as from temporary interference with stock movements, localized areas of noise and intense human activity and equipment operation during well development, potential for damage to range improvements, risks of mortality from livestock-vehicle collisions, and loss of forage due to surface-disturbing activities (partially ameliorated by prompt revegetation of temporarily disturbed areas and long-term weed control).

One comment cited published articles on impacts of oil and gas activities on animal health (e.g., Bamberger and Oswald 2012, 2015). The 2012 paper focused on specific instances of major spills or releases resulting from equipment or operational failures, inadequate monitoring, and in some cases failure of the operator to report and correct the incidents promptly as required. The authors catalogued both lethal and sublethal effects on livestock exposed to spilled or released fluids, primarily from drinking contaminated water. The cases included some involving legal action against the operators, as well as imposition of fines by the respective state (apparently Pennsylvania and New York) regulatory authority.

The authors also noted that wastewaters containing toxic compounds were commonly stored in open pits to which livestock had access, and that these fluids were also sprayed on area roadways as de-icers, from which they could be carried into nearby waters or pastures. Neither the BLM nor the State of Colorado would allow either of these practices for future development of the parcels. The paper did not name specific contaminants, or specific exposure levels that led to the negative effects.

The 2015 paper tracked the same cases across the next 25 months. This part of the study consisted of interviewing individuals about the progression of symptoms, or new symptoms, observed in their animals after the additional time had passed. While some symptoms lessened, others remained or intensified. Although the acute problems of mortality and adverse health symptoms reported in the 2012 paper clearly showed a link to the improper development activities and resulting exposures of livestock to toxicants, the 2015 study was of an epidemiological type and identified most aspects of oil and gas operations in the vicinity as sources of exposure to livestock without demonstrating actual exposures. Health effects on livestock were assumed to be related to proximity to the potential oil and gas sources instead of specific exposures as in the first study. As stated in the 2015 paper, "A descriptive epidemiological study cannot determine prevalence of a health impact and is not designed to determine cause-and-effect definitively."

Recreation and Tourism

Stated Concerns

Many comments expressed concern that the addition of oil and gas facilities on the proposed lease parcels, if approved, would reduce the quality of the area for hunting, fishing, other recreation associated with the natural and scenic quality of the area, recreation focused on Paonia Reservoir, and particularly tourism associated with the North Fork Valley's reputation for high-quality food production, including organic farming.

BLM Response

Section 3.4.7 of the EA (Recreation) describes recreation in the area, while **Sections 3.4.4** (Noise), **3.4.8** (Socioeconomics), **3.4.10** (Threatened or Endangered Species), **3.4.11** (Transportation and Access), **3.4.13** (Visual Resources), **3.4.15** (Water Quality), and **3.4.16** (Wildlife, Aquatic and Terrestrial) also address aspects of the natural and human environment that affect tourism. The proposed leases, as described in the cumulative impacts analyses throughout the EA and summarized in **Table 1** at pages 9-13 in the body of the document, represent a small addition to the current acreage (2.7%) of Federal oil and gas leases in the cumulative effects analysis area (**Map 1** of the EA), some of which are already producing oil or gas, and others of which have been approved for development. However, the EA explains, that additional developments, although representing a small incremental increase, would exacerbate impacts associated with existing or already approved projects and reasonably foreseeable projects.

Each of the EA sections cited above specifically addresses direct, indirect, and cumulative impacts likely to accompany future oil and gas development, and the lease stipulations, design features, and mitigation measures that would be applied to avoid or minimize those impacts. All of these are also addressed in this Attachment in responses to concerns related to each of the components of recreation and tourism listed above. Statutory or regulatory requirements such as those related to air quality, water quality, wetlands and other Waters of the U.S., threatened or endangered wildlife, and noise must always be met. In many ways, however, other aspects of development such as well pad location and density, use of existing instead of new roads, and buffering from residences and sensitive resources can have the greatest impact on the quality of the area for recreation. These are best analyzed and mitigated during future project-specific NEPA review, when specific details of a proposed development can be assessed and adjusted to address subjective (e.g., visual) qualities that also contribute to the area's current recreation and tourism.

It should be mentioned here that, although two parcels (8320 and 8351) are located near and, for some aliquots, bordering Paonia State Park (which includes Paonia Reservoir), the BLM does not expect that any oil and gas facilities would be visible from the reservoir, and that the focused use of the park, including by motorized boats, and the proximity to State Highway 133, would tend to reduce impacts associated with increased traffic on the highway in relation to potential future development. In addition, while the parcels do not include any State Park lands, the future lessee/operator could potentially desire to cross the State Park to access aliquots east of the reservoir. This would require permission from Colorado Parks and Wildlife.

Based on the considerations above, the BLM would not anticipate discernible impacts on the North Fork Valley's attractiveness to outdoor recreationists, agritourists, or scenery-based tourists and other visitors from leasing and future development of the five UFO parcels currently proposed for the December 2018 lease sale.

Socioeconomics, Including Multiple Facets

Stated Concerns

North Fork Valley residents and owners of businesses expressed concern about impacts on quality of life, changes in the social fabric of the community, impacts to property values, economic impacts associated with a feared "boom-and-bust" cycle and the perceived risk of loss of business revenues due to changing environmental conditions relative to tourism and the North Fork Valley's "brand" (i.e., reputation for high-quality organic agricultural products and as a good place to live and raise a family). One comment included an extensive listing of references dealing with socioeconomic impacts of oil and gas developments.

BLM Response

Section 3.4.8 provides a thorough analysis of the type of socioeconomic outcomes expected to accompany leasing and potential future development of the five UFO parcels, and the resource-specific sections of the EA describe stipulations, regulatory requirements, policies, and COAs aimed at reducing impacts associated with the socioeconomic concerns summarized above. Specific to the five UFO parcels currently being considered, the scale of the leases is small in relation to the large area of existing Federal oil and gas leases, although concerns expressed in the comments relate more to a cumulative impact than the direct impact of future development of these leases. The EA explains that certain aspects of quality of life would be affected, although primarily in the area of the leases or along internal roads used to access the leases. Examples include impacts from changes in the levels of dust (**Section 3.4.1**), noise (**Section 3.4.4**), traffic (**Section 3.4.11**), and the visual landscape (**Section 3.4.13**). The respective sections of the EA address these types of impacts and the variety of stipulations, regulations, policies, and COAs intended to reduce their severity. More specifically, it is at the point of future NEPA review of proposals for lease development projects that the impacts can be adequately assessed and mitigated.

In considering the impacts and comments more generally, as is possible at the leasing stage, the BLM notes the following:

(1) The "boom-and-bust" cycle is primarily a concern where the "boom" results in influxes of large numbers of residents into small or remote towns, the economic base of the town changes in response to the increased population, and then the population crashes during the "bust." Increases in employment for future oil and gas development of the area, and particularly for the relatively small parcels currently being considered, are unlikely to involve large numbers of workers and their families. Some long-term relocations to the area may occur, but these would mostly consist of the small percentage of employees and contractors who would remain through the production phase, which would last 20 to 30 years and probably longer. Because winter development activities would be largely precluded, or at least greatly reduced, this would result in greater numbers of workers using local infrastructures and frequenting local

businesses in summer than in winter, but this cyclicity would be expected to be no greater than that experienced by many western Colorado towns during hunting season or summer or winter recreational seasons.

Some comments expressed fear that workers employed or contracted during development of oil and gas would increase the incidence of crime and use of drugs. This comment is commonly made, but the BLM is unaware of data indicating such a linkage in relation to oil and gas activities in western Colorado or similar regions.

(2) Agritourism is an important component of the local economies, an important aspect of the local community identity and a source of pride, and important more broadly because of the large quantities of desirable and healthful agricultural products, especially organic products, originating in the North Fork Valley. The agritourism associated with the North Fork Valley's farms, orchards, vineyards, and ranches also stimulates revenues from purchases and taxes related to other businesses, whether those visited by the agritourists or related to serving the thriving agricultural businesses and their workers and families. The BLM understands the concern expressed by many commenters and business owners that future oil and gas activities could damage their "brand" and adversely affect this source of revenue and local identity. However, because of its extensive experience with oil and gas activities in western Colorado and elsewhere, the BLM does not share the level of concern expressed by many commenters. Instead, the BLM believes, and has found elsewhere in the region, that the types of stipulations, COAs, careful planning, and regular inspection and enforcement—by both the BLM, US Forest Service, and State of Colorado—are very likely to avoid any of the adverse impacts feared. When spills or accidental releases do occur, they rarely extend off the pad or more than a short distance from the pad and are quickly contained and remediated.

Comments indicate considerable concern about contamination of surface water and groundwater, and additional unspecific types of contamination, associated without hydraulic fracturing. This is addressed in **Section 3.4.3** (Geology) and **Section 3.4.15** (Water Quality). Statements in many of the comments indicate an apparent widespread belief that contamination due to use of hydraulic fracturing is commonplace or even a certainty. In reality, documented occurrences of contamination due to use of this technology are extremely rare, even at a national level. The very low incidence of these incidents reflects the careful review of drilling and completion plans for proposed wells by both BLM and State petroleum engineers, the advances in engineering protections that have accompanied use of this technology in "tight" shale gas formations, and the geologic situation of such formations being located thousands of feet below the ground surface and thousands of feet below the depth of freshwater aquifers and surface waters. However, as a precautionary measure, the five UFO parcels would have a lease CSU stipulation that restricts development within 1,000 feet horizontally from, and 1,500 feet vertically beneath, domestic wells. In addition, the State requires the collection and analysis of groundwater baseline samples and subsequent multi-year monitoring samples from up to four domestic wells within a 0.5-mile radius of a proposed oil and gas well, multi-well pad, or dedicated disposal well.

Based on the above, the BLM does not believe that the proposed sale and future development of the UFO parcels would result in a substantial risk to the area's agricultural industry, organic agriculture and associated agritourism in particular, or the health of associated businesses.

(3) Hunting for big game (primarily deer and elk) is an important source of revenue for local economies, and important to many local residents for their personal interest in hunting. For hunters, the main concern is hunting outcome efficiency—whether they get their animal, and how much time will be required for a success. Although active developments during the hunting seasons may cause minor shifts in where hunters go within their permitted area, the amount of area either actually unavailable, or perceived as being inappropriate due to development activities, would be relatively small. A comprehensive study in Wyoming, and BLM's experience in western Colorado, is that the addition of new roads is perceived by some hunters as a benefit by increasing access. Long-term changes in visitation by hunters is affected by

reductions in availability of land for hunting, such as occurs with new rural residential developments on private land. Oil and gas developments would not affect availability of land, although again the distribution of animals and hunters would be likely to shift in relation to active development, and less so to long-term production infrastructure. In terms of hunter success, the BLM believes that future development of the five UFO lease parcels, which would be subject to a big game winter range Timing Limitation stipulation from December 1 through April 15 and a variety of planning tools intended to reduce impacts to big game and their habitat, would be unlikely to affect deer and elk populations at a scale that would result in reduced hunter success or visitation to the North Fork region.

4) Fishing is a much smaller form of recreational use than hunting, although it occurs across a longer period. **Sections 3.4.10, 3.4.15, and 3.4.16** of the EA on water quality and aquatic biota describe NSO protections for streams, including but not limited to streams known to contain genetically pure strains of Colorado River cutthroat trout, and a TL protection for all trout-bearing streams. These stipulations are in addition to the variety of measures designed to prevent contamination of surface waters. The BLM does not expect that development of the five UFO parcels would have any impact on stream anglers, except perhaps for stream segments adjacent to internal access roads and well pads being used for active development—and this would be due to a less attractive situation for the angler, not water quality.

Similarly, the BLM does not expect impacts on fishing or boating on Paonia Reservoir. Although two parcels are located near the reservoir, potential future developments are not expected to be visible from the reservoir. Some temporary traffic-related impacts could occur, but whether this would be the case, and the methods to minimize them, would be addressed during future site-specific NEPA planning. As described in the EA, an NSO stipulation would prohibit surface occupancy or use of lands within Paonia State Park. Although neither of the nearby parcels (8320 and 8351) includes State Park lands, it is possible that the future lessee may request access across the State Park. That potential occurrence would require approval by Colorado Parks and Wildlife.

5) Concern about reduced property values are largely unfounded and even contradicted in Colorado. Such impact could occur at a localized level for a residence or group of residences or parcels of land located very near a new well pad or access road. However, BLM and State setbacks, and the 1,000-foot buffer established by an NSO for occupied dwellings, would reduce that potential outcome.

6) It should be noted that the EA in **Section 3.4.8** presents information on types of direct and indirect revenues at the local, county, and State of Colorado levels that would be expected to result.

7) A few comments asked who would pay cleanup costs and other damages associated with adverse consequences of oil and gas activities, particularly those related to agribusiness. Under the terms of a lease, BLM requires operators and lessees to remedy equipment or operational failures and their impacts, but does not adjudicate liability to third parties. Courts decide issues of liability under applicable law.

Soils

Stated Concerns

Section 3.4.9 of the EA describes potential impacts to soil resources from removal, storage, and later replacement during reclamation; from compaction by operation of heavy equipment; and from loss due to erosion. Most of the few comments mentioning soils focused on soil erosion as a risk to water quality, and potential impacts to agriculture from leaks or spills of chemical contaminants.

BLM Response

As described in **Section 3.4.9** of the EA, physical impacts to soils are largely limited to areas of surface disturbance during construction of pads, roads, pipelines, and other infrastructure. Stormwater controls are installed at the edge of the disturbed areas to control surface runon/runoff and erosion. Soil loss due to erosion is reduced by prohibiting vehicles and equipment outside the approved disturbance limits, which protects the soil resource from physical damage by compaction or damage to the vegetation cover

and disturbance of the soil surface. Temporarily disturbed areas are revegetated promptly to reduce soil erosion from wind and water.

Damage to soil from spills or accidental releases is a different issue from soil damage, loss, or erosion. However, the vast majority of such incidents occur on the well pad and are limited to areas within secondary containment structures installed around storage tanks. Spills or releases on the pad are carried by pad design into stormwater control features (pads are designed so that runoff only discharges from the pad through stormwater control features) and in far fewer cases downgradient from the pad. **Sections 3.4.9 and 3.4.14** describe measures for spill prevention, containment, and cleanup, which also apply to spills or accidental releases associated with pipelines or a haul trucks. For a discussion of potential impacts to surface waters from spills or accidental releases, see the comment response dealing with surface water, above.

Threatened or Endangered Species

Stated Concerns

Although a few comments expressed concern for impacts to the endangered river fishes occupying the main fork Gunnison and Colorado Rivers, most comments on this expressed concern about impacts to the Green Lineage Colorado River cutthroat trout (previously and erroneously referred to as the greenback cutthroat trout), the Canada lynx and yellow-billed cuckoo. The bald eagle, now classified as a BLM sensitive species instead and no longer as a threatened or endangered species, was included in these comments as well. BLM sensitive species are addressed in the Wildlife category, below.

BLM Response

Section 3.4.10 of the EA addresses Federally listed, proposed, or candidate threatened or endangered animals species. No special status plant species are known and expected to occur in the area of the leases, based on habitat types, elevations, and general locations. The EA explains that the area of the lease parcels and surrounding area is not within a Lynx Analysis Unit based on the types of foothills and lower montane habitats that dominate the areas.

As described in **Section 3.4.10**, the yellow-billed cuckoo is known to occur along the North Fork Gunnison River to as far upstream as Bowie, with that reach being proposed as critical habitat. None of the proposed parcels occurs in proximity to that area, and any use of more limited habitat closer to the parcels would be expected to be transitory and addressed in connection with future projects, where appropriate.

Section 3.4.10 also describes stipulations and other measures to avoid impacts to The Green Lineage cutthroat trout and four species of endangered Colorado River fishes, including conformance to conservation measures for the endangered fishes as identified in the 2017 programmatic biological opinion issued by USFWS for Federal oil and gas projects in the Colorado River basin of western Colorado.

Measures to avoid contamination of surface waters, and to respond promptly if a spill or accidental release should threaten a stream, are described in **Section 3.4.15** (Water Quality) and the comment responses about water quality, above.

Transportation and Access

Stated Concerns

Comments on this topic focused on increased traffic volumes, an increased safety risk to other travelers, increased damage to existing roads and associated increases in maintenance and repairs, associated impacts such as dust and noise along access roads, and interference with other road users.

BLM Response

Section 3.4.11 of the EA addresses this topic, including types of impacts and associated mitigation. At the leasing stage, it is not possible to estimate increases in traffic volumes, either in amounts or in timing and duration. This type of information would be compiled and analyzed as part of the NEPA review of future oil and gas projects.

See the paragraph in the BLM response to comments on soils, above, regarding spills and accidental releases of chemicals potentially associated with accidents involving haul trucks.

Vegetation

Stated Concerns

The few comments addressing vegetation did so in the context of the natural and scenic quality of the area, and as habitat for wildlife.

BLM Response

As described in **Section 3.4.12** of the EA, vegetation of the area consists of the same types of upland woodland and shrubland, riparian, and wetland communities as occur throughout the area and region. The EA describes stipulations and other measures for avoiding or minimizing impacts to particular types of plant communities, and to wildlife using those communities. Examples could include isolated stands of montane or subalpine conifers, and of quaking aspen, that support a variety of small birds and nesting by raptors not associated with the more widespread habitats.

Also as described in the EA, no Federally listed, proposed, or candidate threatened or endangered plant species are known to grow in the area of the proposed UFO parcels. However, if that understanding were to change through time, the BLM Statewide stipulation for compliance with the Endangered Species Act would require consultation with the USFWS on any project potentially affecting such species, and the BLM would apply conservation measures identified by that agency.

Visual Resources

Stated Concerns

Comments on visual resources were primarily in relation to the West Elk Loop Scenic and Historic Byway (including State Highway 133 in the general area of the parcels), and secondarily in relation to quality of life related to changes in the current visual landscape.

Response

The addition of oil and gas facilities is an unavoidable visual impact except in already disturbed or industrialized landscapes. However, as described in **Section 3.4.13** of the EA, some tools are available to the BLM to reduce visual impacts, particularly those associated with the West Elk Scenic and Historic Byway due to a specific lease stipulation. As noted in the EA, most measures to reduce visual impacts would be associated with planning, design, and implementation of future oil and gas activities.

Visual impacts during production would also include a requirement to minimize lighting on pads—both number and brightness of the lights—and direct any necessary lights downward to minimize light pollution. During drilling and completions, nighttime activities would require bright lighting for worker safety.

Water Quality: Groundwater, Including Water Wells

Stated Concern

Concern about impacts to water quality were among the most frequent comments. Most of the concern related to groundwater was associated with hydraulic fracturing, and to a much lesser extent with wastewater disposal wells. Issues included groundwater as a source of domestic water and for use in agriculture.

Response

Section 3.4.15 (Water Quality) discusses potential impacts to groundwater, including water wells, associated with oil and gas developments in general and hydraulic fracturing in particular. In addition to isolating the well bore from all but the targeted zone(s) with cement, additional isolation from freshwater or other usable aquifers is achieved with surface casing around the well bore. **Section 3.4.15** of the EA also includes a detailed description of the hydraulic fracturing process, the potential distances across which induced fractures could be expected to extend, and factors that tend to limit their propagation distances. Although fracing fluids contain a number of toxic compounds, **Section 3.4.15**, some of these are consumed in the fracing process, and the presence of these compounds at the surface in flowback fluids and produced fluids is at a much smaller concentration. Most important are the many operational and technological requirements designed to avoid or minimize the risk of exposure of the chemical constituents to human and environmental receptors.

A few commenters mentioned wastewater disposal wells in relation to potential groundwater contamination, but this topic was mostly discussed relative to induced seismicity. This is addressed in **Section 3.4.3** of the EA and in another comment response, above).

Water Quality: Surface Water, Including Public Water Systems

Stated Concerns

Concerns about potential risks to surface waters included protection of habitat quality for the threatened (Green Lineage) native cutthroat trout, to a lesser extent for the more distant Colorado River endangered fishes, and for the quality of streams and Paonia Reservoir to continue to support their use by anglers and other recreationists. Most of the comments, however, focused on use of surface water as a source for public water supplies and for irrigation of the area's organic farming and other agricultural activities.

BLM Response

Aspects of surface water quality in relation to aquatic life and recreational use are addressed in the EA in **Sections 3.4.7** (Recreation), **3.4.10** (Threatened or Endangered Species), **3.4.14** (Wastes), **3.4.15** (Water Quality), and **3.4.16** (Wildlife, Aquatic and Terrestrial), and in some other comment responses in this Attachment. These sections discuss measures that BLM (and the State) regularly employ to address the potential for transport of sediments or chemical pollutants to surface waters.

Section 3.4.15 discusses the presence of two designated Public Water Systems in the general area of, or downstream from, some of the proposed parcels, and of two additional Source Water Protection Areas (SWPAs) in the general vicinity but in different drainages from the parcels or located significant distances upstream from the parcels. The discussion in the EA describes State of Colorado Rule 317B, which applies different levels of protection based on distance from a PWS watershed boundary, and the stipulations applied by the BLM.

Wildlife and Fish, Including BLM Sensitive Species

Stated Concerns

Comments related to fish and wildlife, other than threatened or endangered species (see above), were of two different emphases: (1) impacts to big game (deer and elk) primarily as a concern about impacts to hunting as one of the economic drivers for the area, and (2) impacts to wildlife in general, including various birds, as a source of enjoyment to residents and a non-consumptive wildlife use by non-hunter recreationists. Specific concerns cited included habitat loss, disruption of wildlife behaviors, interference with hunter access and success, loss of attractiveness of the area to birders, and non-specific impacts from chemical contamination.

BLM Response

Section 3.4.16 includes details regarding existing wildlife habitats, wildlife species, potential impacts, and mitigation measures. That section describes impacts related to direct habitat loss from pads, roads, and other long-term facilities, disruption of historic patterns of wildlife distribution and seasonal use and movement, relative by avoidance of areas of intensive human activity, equipment operations, and associated noise, sublethal (e.g., reproductive) effects such as from changes in behavior and possible physiological stresses. The EA also describes stipulations and other measures to avoid or minimize adverse impacts to wildlife and their habitats during future oil and gas projects. This discussion includes general wildlife, species of special interest such as big game species, Birds of Conservation Concern, and fish and wildlife designated as sensitive species by the BLM.

Section 3.4.7 of the EA (Recreation) and the corresponding comment response in the Attachment address issues regarding impacts to hunters.

TROUT UNLIMITED

Letter (4 pages) from Cathy Purves and Garrett Hanks (09/11/18)

Comment

All five parcels offered in this planning area for the December 2018 sale are located in split estate lands and two of those parcels have aliquots on public lands as well (Figure 1). A significant portion of BLM mineral estate in this area is "split estate" where the mineral estate is dominant of the surface estate and the BLM retains the authority to condition leases with requirements of where and how development can proceed, including precluding development altogether if deemed reasonable. We are not asking the BLM to regulate how a surface owner manages his or her property on these parcels; however, we recognize that the BLM has the statutory authority to take reasonable measures to avoid or minimize adverse environmental impacts that may result from Federally authorized mineral lease activity. We note that most of the parcels located in split estate status do have strong stipulations.

BLM Response

Thank you for your comment.

Comment

Currently, parcel 8135 does not have any stipulations for stream or riparian protections, hydrologic protections or water resource protections yet its neighboring parcel 8138 does contain these various stipulations. This is puzzling to us. We request the BLM to be consistent in its parcel handling and remove these two parcels based on the same considerations applied to the previous removal of parcels 8389, 8390, and 8391. The BLM is within its jurisdiction to remove parcels that help to conserve surface resources.

BLM Response

In reviewing the topography and hydrology of that parcel, the BLM does not see a stream with sufficient length on the parcel to warrant an NSO. However, as TU may be aware, BLM's regulatory authority allows relocation of project components (equivalent to creating buffers) of up to 100 meters and establishing seasonal limitations of up to 60 days, which would be protective of any occupied stream reaches. Such COAs may also be applied to protect streams within the parcel if necessary to protected occupied stream segments farther downgradient.

Comment

We have similar concerns for parcel 8351. The aliquot for split estate parcel 8351 is located in Deep Creek, known for its conservation population of Colorado River cutthroat trout. While the BLM has applied strong stipulations including NSO for streams, native trout habitat, and riparian habitat, we believe these stipulations will not be adequate for this important watershed. Deep Creek flows into Paonia State Park and Reservoir, a popular recreation destination. Restricting development on split estate lands with highly sensitive resources is not without precedence in Colorado.

BLM Response

The BLM believes that the cited NSO stipulations for streams, trout, and riparian habitat would be sufficient to protect native trout in Deep Creek.

Comment

Spilt estate parcel 8140 poses significant concern to TU as well. One aliquot of this parcel is located on Henderson Creek, which supports [native trout] populations and remains an important distribution stream for this native trout. Oil and gas development activities on this narrow parcel strip places this stream in a vulnerable position, and this isolated population could easily be at risk. Based on this population's vulnerability to environmental influences, including sedimentation and resulting smothering of trout eggs and fry should this parcel be developed, we respectfully request the BLM remove this parcel from the sale.

BLM Response

Again, the BLM believes that the NSO stipulations cited earlier by TU would be adequately protective of Henderson Creek, East Muddy Creek, and streams farther downgradient.

Comment

Parcel 8320 is adjacent to Muddy Creek, which also flows into Paonia State Park and Reservoir. While the BLM has applied NSO and CSU stipulations for streams, major rivers and riparian areas for this parcel, we have concerns about whether any drilling activities on this small parcel can be adequately contained and not induce harm to surrounding resources of the area.

BLM Response

The BLM believes that the cited NSO stipulations for streams, trout, and riparian habitat would be sufficient to protect native trout in Deep Creek, and that the NSO stipulations cited earlier by TU would be adequately protective of Henderson Creek, East Muddy Creek, and streams farther downgradient.

Comment

Public Land Parcels 8320 and 8351. Given their proximity to the North Fork headwaters and several popular recreation sites, not to mention the [native trout] conservation stream at Deep Creek, TU request that the BLM remove all those BLM aliquot parcels of 8320 and 8351 from the December 2018 sale. The aliquot parcel 8320 on BLM lands is located within a popular recreation trail access for ATV users, horseback riders, hikers, and anglers. Due to the parcel's narrow makeup and proximity to Paonia Reservoir, the BLM should remove this parcel as well from the December sale. Parcel 8351 is even more

troubling, due to its proximity to both Deep Creek, Paonia Reservoir and Thompson Creek. As mentioned under the split-estate discussion, Deep Creek is identified by the State of Colorado as containing conservation populations of [native trout]. The BLM is a cosigner to the Conservation Agreement for Colorado River cutthroat trout and this particular stream is an important refugium for the native trout's survival. We ask that this parcel also be removed from the sale.

BLM Response

BLM believes that the NSO stipulations, other stipulations, COAs available to the agency, and good planning would avoid impacts to the Colorado River cutthroat trout, occupied waters, and other segments that provide for dispersal and, for upstream segments, a source of insect prey and other food items carried downstream.

Comment

We appreciate the review the BLM has undertaken for these parcels in the Uncompahgre field office. We urge the BLM to reconsider issuing these parcels based on all the issues we have mentioned and based on the fact that the BLM is in the middle of their plan revision, allowing the BLM to address this issue now, at the leasing stage, rather than having to invest considerably more effort once the lease is sold and potentially developed. It is the leasing stage that the best efforts for resource protection can be made. Given the sensitive nature of the resources where all these parcels are located, TU believes the most beneficial move the BLM could take to protect these importance resources is to withdrawal these five parcels from the December 2018 sale.

BLM Response

See earlier comment responses regarding this topic.

WESTERN ENVIRONMENTAL LAW CENTER ON BEHALF OF WILDERNESS WORKSHOP, WILDEARTH GUARDIANS, CENTER FOR BIOLOGICAL DIVERSITY, CITIZENS FOR A HEALTH COMMUNITY, HIGH COUNTRY CONSERVATION ADVOCATES, WESTERN COLORADO ALLIANCE, AND SIERRA CLUB

Letter (4 pages) from Laura King, WELC, to Greg Shoop et al., BLM (9/11/2018)
Re: Failure to Solicit and Consider Public Input: Colorado December 2018 Oil & Gas Lease Sale

Comment

BLM has failed to adequately involve the public in the December 2018 Oil & Gas Lease Sale NEPA process. First, BLM has created multiple obstacles to public involvement by (a) only accepting comments through the ePlanning system, and (b) maintaining a broken comment portal and broken document links during the public comment period.

BLM Response

The BLM accepted all comments timely submitted, and any arriving late because of problems with the ePlanning comment system. This included comments emailed to individual BLM staff, or delivered to the BLM via the U.S. Postal Service, commercial courier, or hand delivery. A relatively few individuals or groups expressed difficulty with the portal, and any such problems were promptly corrected.

Comment

Second, BLM is rebuffing and ignoring substantive comments. Initially, BLM failed even to acknowledge receipt, in its "summary of comments," of scoping comments submitted by the Town of Paonia, The Western Slope Conservation Center, the Colorado Farm and Food Alliance, Western Slope Slow Food, the Valley Organic Growers Association, the West Elk Winery Association, and dozens of individuals. After being alerted to the omission, BLM admitted to having received the comments, but

asserted that it need not address the comments, on the basis that they raised no new issues. In fact, the BLM did not address in the Preliminary EA the concerns raised in the comments about the impact of leasing on local organic agriculture, vineyards, orchards, recreation, and tourism.

BLM Response

The BLM prepared a supplement to the tabular summary of comments but, because no new comments were raised in the group that was not initially included, elected not to post the supplemental list. Concerns raised about impacts to local organic agriculture, vineyards, orchards, and tourism were addressed in the Preliminary EA through the analysis of impacts to and impact avoidance or minimization relation to air quality (Section 3.4.1) and water quality (Section 3.4.15), the latter including use of hydraulic fracturing, which was a commonly expressed topic, and protection of Public Water Systems and other water sources used in agriculture. The Preliminary EA also discussed issues related to the use, handling, storage, and production of toxic chemicals (Section 3.4.15. These are the routes of potential direct impacts, while transportation and recreation impacts are potential sources of indirect effects related to visitation by the agritourists. Agritourism was addressed in Section 3.4.8 (Socioeconomics). Because the EA is organized by resource or resource use, it does not include a separate section on agriculture. However, the responses to categories of comments, including concerns about impacts to agriculture and Paonia's reputation for organic agriculture, are included in this Attachment.

WESTERN ENVIRONMENTAL LAW CENTER ON BEHALF OF WILDERNESS WORKSHOP, WILDEARTH GUARDIANS, CENTER FOR BIOLOGICAL DIVERSITY, CITIZENS FOR A HEALTHY COMMUNITY, HIGH COUNTRY CONSERVATION ADVOCATES, AND WESTERN COLORADO ALLIANCE

Letter (205 pages plus 15 attachments) from Laura King (WELC) Re: Comments on the Preliminary Environmental Assessment: December 2018 Oil & Gas Lease Sale (DOI-BLM-CO-N040-2018-0075-EA)

(1) General Comment

Reliance on the 1989 RMP fails to demonstrate that impacts associated with the proposed leasing will not be significant, or that leasing will otherwise sufficiently protect resources in the UFO. This is due to the fact that, by the BLM's own admission, the RMP does not account for the environmental impacts of hydraulic fracturing and modern oil and gas development techniques. Yet by leasing these parcels, the BLM is poised to facilitate just this kind of unforeseen development, despite any analysis as to the actual environmental impacts on both project and programmatic level.

BLM Response

The Preliminary EA does account for impacts from hydraulic fracturing, including public concerns related to both protection of water resources (Section 3.4.15, Water Quality) and to induced seismicity (Section 3.4.3, Geology) to the degree that such potential impacts can be discussed when exact locations, numbers, and types of wells are unknown. The EA and some of the responses to comment summaries in this Attachment also describe the potential for use of one or more wastewater disposal wells because of the volumes of water required for horizontal well development in tight marine shales, and associated potential impacts.

(2) The BLM failed to account for scoping comments submitted by municipalities and others – Page 4

The Preliminary EA contradicts and dismisses concerns about the impact of leasing on local organic agriculture production, vineyards, orchards, recreation, and tourism by stating, "Based on local experiences, leasing the parcels would not be likely to affect tourism or small-scale farms, including orchards and vineyards, in the North Fork Valley, county government expenditures, or land values."

BLM Response

The cited statement refers to agribusiness in other areas of western Colorado in which oil and gas development and agriculture continue to coexist in relative proximity without demonstrated impacts on agribusiness. The BLM acknowledges that a basis for the statement was not included. However, as described in replacement wording, the BLM continues to believe that the layers of stipulations, COAs, and operational requirements associated with planning and implementing oil and gas projects, and ongoing inspection or enforcement would make situations that affect its agriculture, agritourism, and ecotourism highly unlikely. Table 1 of the EA shows that large areas of existing leases, some of which have undergone or are undergoing development, already exist both within and outside the multiple Federal oil and gas units in the vicinity. Table 1 and text in the EA describe that the proposed new leases would represent a small additional amount of Federal leases (2.7%). It seems unlikely that this small increase in either leased land or potential future development would represent some tipping point that initiates impacts when none of these impacts has occurred to date, to the BLM's knowledge.

(3) The BLM should issue a moratorium on all OG leasing so long as Uncompahgre RMP Revision and EIS remains uncompleted – Page 6)

Proceeding with the December 2018 Lease Sale—or any other major Federal action impacting resources in the planning area—is impermissible due to the inherent prejudice that this action will cause to the pending RMP revision. Critically, each of the parcels proposed in the December 2018 lease conflict with existing alternatives being considered in the pending UFO RMP revision, and are either in areas that would be excluded from oil and gas leasing under an alternative, or include stipulations and reservations on leasing that would otherwise apply to proposed parcels. This is the very essence of prejudice contemplated by NEPA regulations.

Moreover, there is no updated, current analysis that identifies what overall level of development, and the nature of that development.is reasonably foreseeable.

BLM Response

Regarding the first point in the comment, the Preliminary EA describes, at Section 2.4 (Plan Conformance Review), the basis for BLM's consideration of leasing parcels with stipulations analyzed in the UFO's Draft Proposed RMP/Final EIS and this EA. The analysis of impacts from possible future lease developments in the Draft EIS considered current resource information, anticipated types and levels of resource impacts, and mitigation measures with a history of success.

Regarding the second point, a Reasonable Foreseeable Development (RFD) for the UFO was prepared in 2012. That RFD, like others, is not a prediction of exactly how much development will occur, and where, but instead is based on extent of areas with varying potentials for fluid minerals development. BLM would rely on information in this technical support document regardless of which RMP alternative is finally selected.

(4) The BLM should use it discretion NOT to lease proposed parcels – Page 8

Just because land is identified for leasing does not mean that it must be leased. If review of a potential lease proposed for sale reveals problems, or that other resources and values should be protected, the agency can decide not to lease, period, and in fact, may be duty-bound, pursuant to laws such as FLPMA, not to lease to ensure that other resources and values are protected.

The MLA and FOOGLRA do not in any way restrict the factors that BLM may consider when exercising its considerable discretion under § 226(a). Therefore, even if the BLM bases its decision entirely on the public's overwhelming opposition to oil and gas development in this area, it has the authority to do so.

BLM Response

The BLM exercises its discretion not to lease parcels in appropriate circumstances. As noted elsewhere in this Attachment, commenters have not identified the potential for unique or disproportionate impacts for which the effectiveness of lease stipulations and mitigation measures available under BLM's regulatory authority is unknown or inadequate.

(5) The BLM must take a hard look at the direct, indirect, and cumulative impacts of oil and gas development on resource values in the planning area – Page 9; An Agency fails to take a "hard look" if it predetermines its NEPA analysis – Page 10

Without analyzing impacts from the lease sale itself, any subsequent analysis intrinsically shifts from *preventing* impacts (and managing lands for other resource values) to merely *mitigating* impacts (and allowing oil and gas lessees to exercise their surface use rights to the lease at the expense of other resource values). It is critical that BLM avoid this scenario. If the parcels are not withdrawn, as urged above, NSO stipulations should be applied to the parcels offered, and mitigation should be relied upon only where such management is clearly supported by detailed site-specific analysis.

This [the pre-determined dates for public involvement, through the protest period] suggests that, regardless of what the agency's environmental analysis indicates, the proposed parcels will be offered for competitive sale in December 2018. Adherence to this timeframe would require that the agency reach a finding of no significant impact ("FONSI"), based not on any actual analysis of impacts, but rather on the predetermined decision to maintain a schedule despite its findings. At a minimum, this creates an improper "inertial presumption" in favor of committing resources to oil and gas development before knowing the site-specific impacts of oil and gas development.

BLM Response

The first point above overlooks that lease stipulations proposed to be attached to the lease parcels include a variety of No Surface Occupancy (NSO) stipulations to be applied to all lands in all parcels. Moreover, stipulations included in Attachment C of the Final EA add to those NSOs. Even the several Controlled Surface Use (CSU) and Timing Limitation (TL), while less "absolute" in their protections than NSO do, in fact, provide ample ways in which the BLM can and does prevent instead of mitigating impacts. Furthermore, preventing impacts is not entirely define what is needed to avoid significant impacts, and CSUs and TLs, even when "mitigating" and impact, are applied to help ensure that impacts are not significant. The BLM did take a "hard look" at the direct, indirect, and cumulative impacts of oil and gas development on the resource values, and both private and public land uses, of the specific parcel areas and the broader North Fork Valley area. Indeed, the wide range of stipulations (totaling 20) based on current resource information and the recent impact analysis for UFO's Draft Proposed RMP/Final EIS, and in this EA, are intended to ensure that direct, indirect, and cumulative impacts were thoroughly analyzed with the most relevant information available.

Regarding the second point above, the BLM disagrees with the inference that setting specific target dates, or "deadlines," predetermine the outcome. The decision that an EA was needed was not difficult, based on the age of the existing RMP and the small number of RMP stipulations. The determination that a thorough and appropriate EA process could be completed within the timeframes needed for a December 2018 lease sale had two components. *First*, BLM personnel working on the lease sale at the Field Office level are familiar with, and knowledge about (1) the general area of the lease parcels from prior oil and gas projects; (2) the NSO, CSU, and TL stipulations appropriate to the area based on the recent analysis in the UFO Draft Proposed RMP/Final EIS; (3) modern (tight shale horizontal) technologies and associated impacts based on prior, recent Master Development Plans (MDPs) and associated EAs and EISs; (4) appropriate types of mitigation measures that could be utilized to avoid, minimize, or offset impacts; and (5) the types of public issues and concerns, again based on prior, recent oil and gas projects in the near vicinity.

The determination that the EA process could meet the target dates with 15-day public scoping and 15-day public review cycles was similarly based on the prior, recent EAs and EISs for oil and gas activities in the near vicinity. These yielded substantial public involvement, as did the RMP process currently underway for the UFO. It was clear from those NEPA processes that the public was familiar with oil and gas projects, associated resources and resource uses of the area, and their concerns relative to the environment, tourism, hunting, recreation, visual quality, and the area's widely recognized and highly regarded organic agriculture. This was borne out by the fact that the 15-day public involvements yielded 357 individual or group comment submissions at scoping, and 393 individual or group submissions on the Preliminary EA. Most submissions in turn consisted of multiple comments on different issues and concerns. The knowledge and sophistication represented in the public comments also evinced familiarity with what was being proposed, and with the potential outcomes.

Finally, it is important to point out that, had the analysis performed or the comments reviewed by the Field Office staff indicated a potential impact that could not be avoided or adequately mitigated by the stipulations, design features, and mitigation measures, the Field Office staff would have elevated the issue to the BLM Colorado State Office for further consideration and, if necessary, removal of the parcel pending further review.

(6) Because an irretrievable commitment of resources will occur at the lease sale stage, BLM must consider impacts prior to the sale – Page 13

Because BLM is irretrievably committing resources at the lease sale stage, it must thoroughly consider the impacts of its decision to lease parcels before it can confer public resources to a private developer in a lease.

BLM Response

The EA process thoroughly considered the impacts of leasing the UFO parcels. As a first step, the BLM determined what stipulations were appropriate, based on recent and relatively complete resource information was available as a result prior, recent oil and gas EAs and EISs, and the analysis in the Draft Proposed RMP/Final EIS for the UFO RMP. In many cases, as noted above, this resulted in the application NSOs, and of CSUs and TLs, to all lands on all parcels when needed to ensure adequate protection. The BLM then analyzed the reasonably foreseeable impacts of leasing the proposed lease parcels with appropriate stipulations.

The BLM believes that existing knowledge about the area, resources, land uses, and modern development techniques is sufficient to assess whether leasing the proposed parcels, subject to stipulations and COA, would be expected to have significant environmental consequences.

However, offering the leases for sale, if that is the final outcome, is not the end of BLM's responsible to avoid undue degradation. In connection with any future development proposed in an APD or MDP, the BLM will analyze the specific parcel and specific proposal (including the number, size, and location of well pads and associated number of wells; the lengths and alignments of new or expanded roads and pipelines; specific drilling technology; sources and volumes of water; methods of water movement and disposal; estimates of air emissions; and other considerations). This analysis will also evaluate project components and practices in relation to topography, soils, vegetation, hydrologic features, seasonal wildlife occurrence and use, and visual quality, and in relation and areas of public occupation, use, or travel.

When preparing for a lease sale, BLM staff knows enough about the parcel locations, associated resources, typical oil and gas developments, and the RMP stipulations to analyze whether the leases would be generally compatible with other resources and land uses and whether, with stipulations and COAs, BLM can make a finding of no significant impact. BLM does not have enough information at the leasing stage to analyze and approve APDs. Subsequent NEPA review, detailed project design, and

detailed impact analysis and mitigation planning for future projects would, in turn, provide a basis for approving, modifying, or denying specific project components and activities.

(7) The preparation of an Environmental Impact Statement (EIS) is required prior to the issuance of the lease – Page 14

If BLM "decides not to prepare an EIS, 'it must put forth a convincing statement of reasons' that explains why the project will impact the environment no more than insignificantly. This account proves crucial to evaluating whether the [agency] took the requisite 'hard look.'" In the instant case, however, the BLM would be hard pressed to reach any conclusion other than that development in this area *may* result in significant degradation.

BLM Response

The BLM disagrees with this conclusion. After reviewing and applying lease stipulations, evaluating parcel-specific locations and known resources and environmental conditions including unique or highly sensitive resources or hazardous conditions, considering the type of oil and gas development likely to occur in the future, considering the leases in the context of other land uses (including existing oil and gas, recreation, tourism, ranching, and farming), and considering the potential for unavoidable adverse direct, indirect, or cumulative impacts on human health and the environment, the BLM concluded that the CEQ criteria for determining that impacts would not be significant (40 CFR 1502.2(b)) would be satisfied. Moreover, the unsigned FONSI accompanying the Preliminary EA presented the list of significance criteria and summarized BLM's basis for determining that each criterion supporting the FONSI would be satisfied.

(8) The BLM must take a hard look at air quality and climate change (including multiple subtopics) – Pages 14 – 87

BLM Response

BLM believes that the lengthy discussions in Section 3.4.1 (Air Quality and Climate Change) of the EA and in some of the responses to other comments in this Attachment (e.g., responses to the EPA and Colorado Department of Public Health and Environment) and BLM's Colorado signature process for ensuring adequate protections related to these topics, form a composite and sufficient response to these comments for the leasing stage. However, it is only at the point of future oil and gas projects that Colorado BLM's air emissions inventory, predictive air quality modeling process (near-field, far-field, and cumulative), and analysis of equipment and operational constraints to ensure conformance with National and Colorado Ambient Air Quality Standards (NAAQS/CAAQS) and Air Quality Related Values (AQRVs) can be appropriately performed.

In connection with the UFO lease sale EA, lack of specificity regarding future projects precludes meaningful assessment of air quality impacts and application of any needed mitigation measures. However, Section 3.4.1 of the EA provides a thorough discussion of existing air quality in the lease area, describes nearby Prevention of Significant Deterioration (PSD) Class I and Class II areas, describes that three recent or in-process oil and gas projects in the near vicinity (Bull Mountain MDP EIS, Dual Operator 5-Pad EA, and North Fork Mancos MDP) have been incorporated into the CARMMS (Colorado Air Resource Management Modeling Study). The analyses for those three projects, including mitigation measures applied to the Bull Mountain MDP, results in the conclusion that the projects are not expected to cause ambient air quality fully to exceed NAAQS/CAAQS or adversely affect AQRVs to a significant degree.

The comments in the pages associated with air quality and climate change also mention that the BLM should utilize the methodologies developed and adopted by the Federal Interagency Working Group on Social Cost of Greenhouse Gases (IWG, formerly known as the Interagency Working Group on Social Cost of Carbon). The methodologies, including the social cost of carbon (SCC) and social cost of

methane (SCM) protocols, assist agencies in addressing Executive Order (E.O.) 12866, which requires Federal agencies to assess the cost and the benefits of proposed regulations as part of their regulatory impact analyses. The SCC and SCM are estimates of the economic damages associated with an increase in carbon dioxide emissions and methane emissions, respectively, and are intended to be used as part of an economic cost-benefit analysis for proposed rules.

The BLM is not using the SCC or SCM protocols for this lease sale decision for a number of reasons. Most notably, this action is not a rulemaking, for which the protocols were originally developed. Second, on March 28, 2017, the President issued E.O. 13783, which, among other actions withdrew the Technical Support Documents upon which the protocols were based and disbanded the IWG. The Order further directed agencies to ensure that estimates of the social cost of GHGs used in regulatory analyses "are based on the best available science and economics" and are consistent with the guidance contained in OMB Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates" (E.O. 13783, Section 5(c)). In compliance with OMB Circular A-4, interim protocols have been developed for use in the rulemaking context. However, the Circular does not apply to leasing decisions, so there is no E.O. requirement to apply the protocols to leasing decisions.

Additionally, social cost of carbon/methane estimates are just one approach that an agency can take to examine climate consequences from GHG emissions associated with the proposed leasing. In this EA, climate consequences are examined through calculations of GHG emissions from oil and gas production at various scales (statewide, nationwide, global), projections of potential indirect and downstream GHGs associated with future oil and gas development, and a qualitative discussion of potential climate impacts. The BLM took this approach because climate change and potential climate impacts, in and of themselves, are often not well understood by the general public (Etkin and Ho 2007, National Research Council 2009). This is in part due to the challenges associated with communicating about climate change and climate impacts, stemming in part from the fact that most causes are invisible factors (such as GHGs) and there is a long lag time and geographic scale between causes and effects (National Research Council 2010).

When addressing difficult environmental issues such as climate change, research indicates that most people more readily understand the issue when presented at a scale that is relatable in everyday life (Dietz 2013); when the science and technical aspects are presented in an engaging way such as narratives about the potential implications of climate impacts (Corner et al. 2015); and when examples are used and information is relevant to the audience while also linking the local and global scales (National Research Council 2010). The approach taken by the BLM recognizes projected environmental effects of climate change, provides potential GHG emission estimates, and discusses potential climate change impacts qualitatively.

Furthermore, the comment incorrectly states that the EA touts the "economic benefits of the lease sale." This EA provides no quantitative monetary estimates of any benefits or costs. NEPA does not require an economic cost-benefit analysis (40 C.F.R. § 1502.23), although NEPA does require consideration of "effects" that include "economic" and "social" effects (40 C.F.R. 1508.8(b)). The EA qualitatively discusses how potential revenue from the lease sale may be disbursed and the potential economic activity that could occur related to potential future oil and gas development of those leases. The potential economic activity such as royalty revenue, jobs, and income associated with lease sales and future development should not be mischaracterized as "economic benefits of the lease sale." Effects associated with production or any other forms of economic activities (often expressed in terms of employment, income, and output) are the results from an economic impact analysis. An economic impact analysis is distinct from a cost-benefit analysis (Watson et al. 2007, Kotchen 2011) and the social cost of carbon/methane estimates are a type of cost-benefit analysis.

Based on their views and values, people may perceive this increased economic activity as a 'positive' impact that they desire to have occur; however, that is very distinct from being an 'economic benefit' as defined in economic theory and methodology (Watson et al. 2007, Kotchen 2011). Additionally, another person may perceive increased economic activity as a 'negative' impact due to potential in-migration of new people, competition for jobs, and concerns that newcomers will change the sense of community and community qualities that are important to herself/himself. Therefore, it is critical to distinguish that how people may perceive an economic impact is not the same as, nor should be interpreted as, a cost or a benefit as defined in an economic cost-benefit analysis.

Without any other monetized benefits or costs reported, monetized estimates of the social cost of carbon/methane emissions would be presented in isolation, without any context for comparison. Quantifying only the costs of oil and gas development by using the social cost of carbon/methane metrics but not the benefits (as measured by the economic value of the proposed oil and gas development and production generally equaling the price of oil and gas minus the cost of producing, processing, and transporting the minerals) would yield information that is both inaccurate and not useful for the decision-maker, especially given that there are no current criteria or thresholds that determine a level of significance for social cost of carbon monetary values.

(9) The BLM must take a hard look at hydraulic fracturing – Page 93

BLM Response

This topic is addressed with regard to induced seismicity in Section 3.4.3 (Geology) and with regard to protection of water resources is Section 3.4.15 (Water Quality, Surface and Ground). Additional information is presented in some of the responses to comment summaries in this Attachment. The BLM believes that the EA provides sufficient information on hydraulic fracturing and associated risk levels for the leasing stage, when specific information on future well development is unavailable.

(10) The BLM must take a hard look at wastewater disposal – Page 102

BLM Response

This topic is addressed with regard to induced seismicity in Section 3.4.3 (Geology) and with regard to protection of water resources is some of the responses to comment summaries in this Attachment. The BLM believes that the EA provides sufficient information on wastewater disposal wells and associated risk levels for the leasing stage, when specific information on future well development is unavailable.

(11) The BLM must consider traffic impacts that will result from increased oil and gas development – Page 102

BLM Response

This topic is addressed in **Section 3.4.11** (Transportation and Access) and in some of the responses to comment summaries in this Attachment. The BLM believes that the EA provides sufficient information on transportation impacts for the leasing stage, when specific information on future well development is lacking. The BLM believes that the EA provides sufficient information on impacts and risk levels associated with human health for the leasing stage, when specific information on future well development is unavailable.

(12) The BLM must consider the impact of exempt rural gas-gathering pipelines – Page 104-105

The BLM must provide a clear assessment of what pipelines are required, what pipelines are "feasible," whether they would be limited in what they transport, how many barrels per day they would transport, and how much truck traffic this would displace (if any, since the pipelines ultimately are transferring product to trucks).

We understand that BLM does not have the authority to approve permits for or to regulate pipelines for safety. We are, however, looking to the BLM to ensure that its actions take into account the risks posed

by these exempt pipelines that are necessary infrastructure for natural gas development projects, and the ability for those risks to be prevented or mitigated under the current regulatory framework. The BLM must demonstrate how in the absence of authority to regulate pipeline safety and integrity, and in the absence of other government agencies—county, state and Federal—available to fill the gap in inspection, monitoring and oversight of rural gas gathering pipelines, how it is that the BLM can: (1) meet its NEPA obligation; (2) meet its statutory obligations; and (3) prevent the risks created by its decision to lease these parcels.

BLM Response

This topic is addressed in **Section 3.4.14** (Wastes, Hazardous or Solid). At the leasing stage, the BLM cannot know what new pipelines, or existing pipelines, will be used to transport natural gas, produced water, or raw water. We would not anticipate pipeline transport of liquid condensate if the Mancos Formation is targeted, as it generally produces only small amounts of condensate. For any construction of new gas gathering pipelines, the operator would be required to comply with current pipeline safety requirements related to materials, corrosion protection, installation method (depth, welding, proper surface signage, etc.), and frequency and type of inspection and maintenance. For existing gas gathering pipelines located offsite but possibly tied into, the BLM would require the lessee proponent to document its previous construction and inspection of the pipeline. An inspection program for existing pipelines is part of the State's new flowline regulation process.

Ensuring that gas gathering lines and other flowlines would be one of the primary components of the NEPA process of possible future oil and gas projects.

(13) The BLM must look at seismicity – Page 108

BLM Response

The topic of seismicity is addressed **Section 3.4.3** (Geology) in the EA and some of responses to comment summaries in this Attachment. The BLM believes that the EA provides sufficient information on hydraulic fracturing and associated risk levels for the leasing stage, when specific information on future well development is unavailable.

(14) The BLM must take a hard look at impacts on human health – Page 113

BLM Response

Impacts to human health are addressed at multiple points in the document in relation to Air Quality (**Section 3.4.1**), Geology (Section **3.4.3**), Soils (**Section 3.4.9**), Wastes (**Section 3.4.14**), and Water Quality (**Section 3.4.15**) and in responses to some of the comment summaries in this Attachment, including subsection titled "Human Health."

(15)* The *BLM must take a hard look at potential impacts to public water supplies, and consider alternatives to reduce impacts – Page 117

BLM Response

Information related to Public Water Systems and Source Water Protection Areas was included in the EA in Section 3.4.15 (Water Quality) and in responses to some of the comment summaries in this Attachment. The BLM believes that this information is adequate for the leasing stage, when specificity regarding future oil and gas development is lacking.

(16) The BLM must take a hard look at potential impacts special places, lands with wilderness character, and important historical resources, and consider alternatives that protect those resources – Page 117 *BLM Response*

BLM has identified no lands with wilderness character in the vicinity. The West Elk Loop Scenic and Historic Byway was mentioned and addressed in the EA. No historic properties are currently known in

the area based on a records search, but cultural surveys would be conducted for any future oil and gas projects. The BLM believes that this information is adequate for the leasing stage, when specificity about future well development is lacking.

(17) The BLM must address wildlife – Page 118

BLM Response

Section 3.4.16 (Wildlife) and **Section 3.4.10** (Threatened or Endangered Fish and Wildlife) of the EA and responses to some of the comment summaries in this Attachment provide detail on these resources, potential impacts, and mitigation. This includes species listed in the comment, i.e., big game ungulates (elk, mule deer, and moose), the Canada lynx, the yellow-billed cuckoo, bald eagle, purple martin, northern goshawk, native cutthroat trout, and bluehead sucker. The Gunnison sage-grouse is not considered present or potentially present in the North Fork planning area. The BLM believes that this information is adequate for the leasing stage, when specificity regarding future oil and gas development is lacking.

(18) The BLM should address Best Management Practices – Page 143

BLM Response

A variety of Best Management Practices can reduce impacts to humans and the environment. The list of items mentioned in the comment are only some of the BMPs that might be used, and most BMPs are incorporated into project design by project proponents precisely because they are best management practices. BMPs may be included as design features in a future proposal, or simply incorporated without being called out specifically. BLM requires other BMPs and mitigation measures, and may include them in subsequent monitoring. Every approval of surface-disturbing activity includes a suite of these site-specific or project-specific Conditions of Approval (COAs). Because BMPs are identified and applied based on specific project components and resource components, they cannot be addressed in detail at the leasing stage. However, the EA includes descriptions throughout of types of measures that would be applied as design features or COAs when needed to adequately describe impact abatement for a specific resource.

(19) Exempt Gas Gathering Pipelines – Page 159

BLM Response

See response to WELC comment 12.

(20) The BLM must take a hard look at impacts to water resources (include groundwater, surface water, antidegradation, water quality standards, and water quantity) – Page 162

BLM Response

The BLM does so, at the level possible and appropriate at the leasing stage, in **Section 3.4.14** (Water Quality) of the EA. Responses to some of the comment summaries in this Attachment provide additional information. As with other resources, however, the most appropriate time to consider specific impacts and specific measures to avoid them is during future NEPA planning of oil and gas development projects, at which time critical information on the location and the drilling and surface use plans of operation would be available to inform the analysis.

(21) The BLM must sufficiently analyze all reasonable alternatives – Page 170

BLM Response

Section 1.4 (Decisions to be Made) states, "The BLM will decide whether to lease all, some, or none of the currently proposed five parcels at the December 2018 lease sale. The BLM will also decide what stipulations should be attached to the parcels, and whether the stipulations should be applied to all lands in the parcels or to specific aliquots (portions).

To analyze every permutation of the above, even with only five parcels, would be unnecessarily difficult, and it would be made more difficult if separate portions of certain parcels were to be included in the mix. Attempting to analyze potential intermediate outcomes would be futile, due to both the large number of potential permutations and the differences between parcels in relation to size, location, and associated resource and resource-use values. It would be neither meaningful to pro-rate the different permutations (three parcels having 60% the impacts of five parcels) nor to delve into comparing hypotheticals of numbers of wells and pads based on their sizes, numbers and lengths of new roads based on their locations, or the myriad of physical, biological, and human-use differences among them.

The two ends of the continuum of potential decisions consists of (1) leasing all of the five parcels, as in the Preferred Alternative, or (2) leasing none of the five parcels. The original Proposed Action consisted of leasing eight parcels, but that alternative was replaced with the Preferred Alternative when the three parcels associated with underground coalmines were removed. Any possible decisions regarding leasing none, some, or all of the parcels would fall within this range of alternatives.

(22) Endangered Species Act conformance (various aspects, including adequacy of the PBO for the endangered Colorado River fishes – Page 176

BLM Response

The leasing process for BLM Colorado does not involve Section 7 Consultation with the U.S. Fish and Wildlife Service unless a "No Effect" determination cannot be made for all species except the four endangered Colorado River fishes included in the 2017 Programmatic Biological Opinion (PBO) for depletions in flows associated with BLM-authorized oil and gas activities utilizing water from the Colorado River Basin of western Colorado.

The analysis of threatened or endangered species for the UFO leasing EA, presented in **Section 3.4.10** of the EA, addresses listed, proposed, or candidate species potentially present or known to occur and potentially affected by subsequent oil and gas projects. Again, however, the effects determination is in relation to leasing, and the applicable stipulations allow a "No Effect" determination for leasing. Project-specific Section 7 Consultation would be initiated with the U.S. Fish and Wildlife Service for any project for which the applicable stipulations and COAs would not support a "No Effects" determination for leasing. The exception to this involves the four endangered Colorado River fishes, which are addressed in the 2017 PBO issued by FWS and which would apply to future BLM-authorized oil and gas projects. See the earlier comment responses regarding the Canada lynx, yellow-billed cuckoo, and Green Lineage Colorado River cutthroat trout.

(23) Unnecessary and Undue Degradation (FLPMA) – Page 201

Pursuant to the Federal Land Policy and Management Act ("FLPMA"), 43 U.S.C. § 1701 et seq., "[i]n managing the public lands," the agencies "shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands."

BLM Response

The BLM's consideration of resource issues in the EA reflects this responsibility.

ALISON GANNETT, HOLY TERROR FARM

Comments Submitted Electronically (191 pages)

Comment

I am a farmer, commercially selling produce, fruit, grapes, cattle, pigs, chickens, eggs, nuts and more at Holy Terror Farm, in Paonia, Colorado. I live right adjacent to Hubbard Creek (and those proposed lease parcels 8135 and 8138), and we also have 13 acres of Fire Mountain Ditch on our property, which fills our domestic water well, from Paonia Reservoir (and those proposed lease parcels, 8140 and 8320, 8351).

We ski, hike, hunt, fish and recreate on all the parcels proposed - they are pristine, quiet and untouched. This is why we moved here.

Those proposed lease parcels up the Muddy Creek/Huntsman's Ridge and those around the Paonia Reservoir would affect not only our irrigation water, but also our drinking water. Our farm was founded in 1883, and we bought it ten years ago for the clean air, water and soil. I had gotten terminal malignant brain cancer and endocrine/thyroid issues from the radioactive and heavy metal contaminated water from living in Crested Butte for 20 years, so we moved to the North Fork to avoid water contamination and help my body heal. We also grow and raise all our own food - all but coffee, chocolate, and salt.

Clean soil, water and air is why we are here, and ANY new leasing is a potential spill waiting to happen, that could have a terminal effect, even in tiny amounts, on my brain cancer. Myself, like many others with cancer, have DNA mutation that make us super susceptible to even small amounts of heavy metals, radioactivity, and the many chemicals known to cause cancer in the fracking database, see below summary on fracking chemicals that are known and suspected to cause cancer [provided in the comment]. Just one spill upstream from our farm, and it could mean the end of my life. It could also mean the end to our commercial farm - if there is a spill with toxins, and we irrigate our foods for sale, and then sell them, we could get sued and make people really sick. We sell to schools, nursing homes, hospitals, farmer's markets, restaurants - they are all over Colorado.

BLM Response

The BLM understands your situation and concerns, similar to those expressed in many comments, but is confident that the lease stipulations, design features, best management practices, and additional mitigation measures available to the BLM through its regulatory authority, and proper planning at the point of future oil and gas project proposals, are sufficient to avoid the types of adverse impacts expressed in the comment.

Comment

A farmer friend of mine in the Rifle/Silt area had a spill on his creek that runs thru his farm, just like a creek runs through ours (Terror Creek). There was a spill upstream, and his drinking and irrigation water was contaminated. He could not stay and farm, and he could not sell his property. It was worth over a million dollars, and now no one wanted it. He became sick, and his animals, yet he could not leave, and he could not afford to buy water for that kind of acreage.

BLM Response

The BLM Colorado River Field Office in Silt is unaware of any such event having occurred in this area, either regarding Federal or private minerals, in at least the past 12 years since the oil and gas program office was established. In addition, the BLM inquired informally with the State of Colorado oil and gas program office in Rifle, also without a specific situation coming to light. However, if the commenter would care to provide us the name of the farmer friend, the location where the incident is said to have occurred, and an approximate date, we would be interested in looking into it.

Comment

The BLM should withdraw all parcels from the Dec 2018 lease sale until the gathering lines exemption law suit is determined – this should also be a reason to withdraw. Until all pipelines are inspected, there is no way to conclude that there are no significant impacts, as the EA states, if these are not inspected (which they are not). Only 10% of gathering lines are regulated, and potentially inspected. But without enough inspectors, how can the BLM say that there are no leaks? And that this is not a significant impact if unknown.

Defer offering lands for lease until the RMP is complete; hold public hearings on this action; include missing comment letters, such as the Town of Paonia, in the final EA.

Due to the fact that the EA did not take into consideration the studies below, all lease parcels should be withdrawn.

BLM Response

Regarding rural gas gathering lines, please see BLM's Response to Comment 12 from the Western Environmental Law Center (WELC), above.

Regarding the second point, the BLM determined, also as described in the EA, that the level of public involvement for the EA was adequate and appropriate. The No Action Alternative would constitute a decision to withdraw or defer the parcels.

Regarding your last point, not having cited a study in the EA does not mean that BLM staff are unaware of the study or of the concepts and conclusions presented by the study. BLM staff reviewed the approximately 150 citations (excluding many duplicates) included in the 191-page submission, reviewed the abstracts of titles that appeared new or most relevant, and downloaded entire PDFs of the papers in many cases. None of the studies reviewed presented new information that would affect decisions regarding application of lease stipulations or making the parcels available for the December 2018 lease sale.

Table F-1. Lease Stipulations Applied to UFO Parcels Included in the December 2018 Sale

Stipulation Based on Proposed Draft Proposed RMP/Final EIS	***Stipulation Synopsis***
UFO-NSO-Hydrologic Features	No surface occupancy or use within 100 meters (325 feet) is allowed from the mapped extent of perennial, intermittent, and ephemeral streams; riparian areas, fens and/or wetlands; and water impoundments.
UFO-NSO-Native Cutthroat Trout	No surface occupancy or use is allowed within 325 feet of the edge of the ordinary high-water mark (bank-full stage) of occupied habitat for conservation populations (90% pure or greater) of native cutthroat trout (includes the threatened Green Lineage and sensitive Blue Lineage strains).
UFO-NSO-Occupied Dwellings	No surface occupancy or use is allowed within 305 meters (1,000 feet) of occupied dwellings and building units as defined by the State of Colorado.
UFO-NSO-Public Water Supplies	No surface occupancy or use within 305 meters (1,000 feet) on either side of a classified surface water-supply stream segment (as measured from the average high high-water mark) for a distance of 5 miles upstream of a public water supply intake classified by the State of Colorado as a "water supply," and within 2,640 feet (0.50-mile) buffer of all public water supplies that use a groundwater well or groundwater under the direct influence of surface water. No directional drilling within 457 vertical meters (1,500 vertical feet) below a surface public water supply or 457 vertical meters (1,500 vertical feet) below the depth of a public water supply that use a groundwater well or groundwater under the direct influence of surface water.
UFO-NSO-Raptor Nest Sites	No surface occupancy or use within 0.25 mile or 0.5 mile of raptor active nests or inactive nests (if used within previous 5 years and all or part of the nest remaining).
UFO-NSO-Steep Slopes >40%	No surface occupancy or use is allowed on lands with steep slopes greater than 40%.
UFO-CSU-Cultural Resources	Surface occupancy or use may be restricted, including special design, construction, and implementation measures and relocation of operations by more than 200 meters (656 feet), due to historic properties and/or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Office and Tribal consultation) under applicable requirements of the National Historic Preservation Act and other authorities.
UFO-CSU-Domestic Water Wells	Surface occupancy or use may be restricted on lands located within 305 meters (1,000 feet) of horizontal distance from domestic water wells. Special engineering design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. No directional drilling will be permitted within 457 meters (1,500 feet) of vertical distance below the depth of a domestic water well within a 1,000-foot radius.
UFO-CSU-Hydrologic Features (used in combination with UFO-NSO-Hydrologic Features)	Surface occupancy or use may be restricted on lands from 325 to 500 feet outside and adjacent to perennial, intermittent, and ephemeral streams; riparian areas, fens, and/or wetlands; and water impoundments. Surface disturbing activities may require special engineering design, construction, and implementation measures, including relocation of operations beyond 200 meters (656 feet) from the extent of water impoundments, streams, riparian areas, and/or wetlands to protect water resources.

Stipulation Based on Proposed Draft Proposed RMP/Final EIS	*Stipulation Synopsis*
UFO-CSU-Paleontological Resources	Surface occupancy or use may be restricted due to paleontological resources. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. An inventory of paleontological resources may be required before construction and drilling may commence. The BLM may require that a qualified paleontologist be present to monitor operations during surface disturbing activities.
UFO-CSU-Plant Community	Surface occupancy or use may be restricted within occupied habitat that meets BLM's criteria, as established in the RMP, for significant and/or relict plant communities (i.e., Exemplary, Ancient, and Rare Vegetation Communities). Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit a plan of development that would demonstrate that habitat would be preserved to maintain the viability of significant or relict plant communities.
UFO-CSU-Public Water Supplies	Surface occupancy or use may be restricted on lands located greater than 305 meters (1,000 feet) but less than 805 meters (2,640 feet) (0.50 mile) of a classified surface water supply stream segment (as measured from the average high-water mark) for a distance of 8.05 kilometers (5 miles) upstream of a public water supply intake classified by the State as a "water supply," and all public water supplies that use a groundwater well or spring. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. The operator shall comply with all applicable sourcewater protection plans developed by public water providers.
UFO-CSU-Raptor Breeding Habitat	Special design and implementation measures, including relocation by more than 200 meters (656 feet), may be required within 1.0 mile of active nests of raptors (accipiters, buteos, falcons except the American kestrel.
UFO-CSU-Scenic Byways	Surface occupancy or use may be restricted within 805 meters (0.5 mile) of designated scenic byways. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required to protect the scenic (visual) values.
UFO-CSU-Steep Slopes (30-39%)	Surface occupancy or use may be restricted on steep slopes of 30% to 39%. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit an engineering/reclamation plan to mitigate potential effects to slope stability.
UFO-TL-Big Game Winter Habitat	No surface use and surface-disturbing and disruptive activities are allowed during the periods December 1 through April 15 in big game critical winter habitat (including severe winter range and/or winter concentration areas) as mapped in the RMP, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies for specified species-specific time periods for mule deer, elk, moose, and bighorn sheep.
UFO-TL-Coldwater Sportfish and Native Warmwater Fish	No in-stream channel work is allowed within occupied fisheries, as mapped in the RMP, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies, for coldwater sportfish (cutthroat trout, rainbow trout, brown trout, and brook trout) and native warmwater fish (flannelmouth sucker, bluehead sucker, and roundtail chub), from April 1 to July 15.

Stipulation Based on Proposed Draft Proposed RMP/Final EIS	*Stipulation Synopsis*
UFO-TL-Raptor Breeding	No surface use is allowed within a 402-meter (0.25-mile) radius of active raptor nests, as mapped in the Resource Management Plan, BLM's GIS database or other maps provided by local, state, Federal, or Tribal agencies that are accepted by the BLM, during species-specific time periods, or until fledging and dispersal of young:
UFO-TL-Sensitive Raptor Breeding	No surface use is allowed within a 805-meter (0.5-mile) radius of active nests of BLM sensitive raptor nests, as mapped in the Resource Management Plan, BLM's GIS database or other maps provided by local, state, Federal, or Tribal agencies that are accepted by the BLM, during species-specific time periods, or until fledging and dispersal of young.
UFO-TL-Wild Turkey Winter Habitat	No surface use is allowed within wild turkey winter habitat, as mapped in the Resource Management Plan, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies that are analyzed and accepted by the BLM, from December 1 to April 1.

Table F-2. Alphabetical List of Elected Officials or Governmental Commenters

C. Douglas Atchley – Delta County Board of County Commissioners (C. Douglas Atchley, J. Mark Rocher, and Don Suppes)
Gov. John Hickenlooper
Matthew Hoyt – Gunnison County Board of County Commissioners (John Messner, Jonathan Houck, and Phil Chamberland)
Kenneth D Knight – Town of Paonia
Madeiline West – Colorado Department of Natural Resources
Sen. Michael Bennet
Sean Hackett – Colorado Department of Public Health and Environment

Table F-3. Alphabetical List of Commenters Representing Environmental Groups and Other Organizations

Alex Johnson – Western Slope Conservation Center (including Conservation Colorado, The Wilderness Society, and Wilderness Workshop).
Brent Helleckson – West Elks Winery Association
Cathy Purves, Garrett Hanks – Trout Unlimited
Diane Dascalu-Joffe – Center for Biological Diversity
Garrett Hanks – Trout Unlimited
Jeremy Nichols – WildEarth Guardians
Jim Brett – Slow Food Western Slope
Kyle Tisdel – Western Environmental Law Center (on behalf of various other environmental groups)
Laura King – Western Environmental Law Center (on behalf of various other environmental groups)
Louise Eberle – Sierra Club
Matt Reed – High Country Conservation Advocates
Natasha Leger – Citizens for a Healthy Community
Pete Kolbenschlag – Colorado Farm and Food Alliance (including Slow Food Western Slope, Valley Organic Growers Association, and West Elks Winery Association)
Peter Hart – Wilderness Workshop
Rebecca Fischer – WildEarth Guardians
Steve Allerton – Western Colorado Alliance

Table F-4. Alphabetical List of Private Individual and Business Commenters

Adele Riffe	Jason Kassoff	Natasha Leger
Alex Johnson	Jean Webster-Doyle	Nicole Carpenter
Ali J. Lightfoot	Jennifer Lukes	Nicole Greene
Alison Gannett	Jim Brett	Patricia Del Tredici
Amber Kleinman	Jim Matusoff	Patricia Kaech
Amy Brooks	Jo Ann Jarreau	Patricia Walsh-Oeink
Adele Riffe	John Ferrell	Patrick Webb
Ausan Kaldis	Joshua Paigen	Paula Sieve
Barb	Julia Bowman	Pete Kolbenschlag
Barbara Arrindell	Julie and Neil Stransky	Peter Giannini
Barbara G Guse	Kacey E Kropp	Peter Mueller
Beverly Kolkman	Karen M Ortiz	Philip Bennett Wassell
Bobby Riggs	Kaspar Keil	Pieter Van Winkel
Brad Burritt and Danielle Carre	Kathleen Steid Noe	Prima Merry
Brent Helleckson	Kelly Coffman	Richard J Gilmore
Dr. Brian Griffith	Kelly R Sweeney	Rita Clagett
Carol Blitz Smith	Kirsten Atkins	Robert Orlando
Carol Pierce	Krista Dudley	Robin B. Nicholoff
Cathy Purves	Laura Lee Yates	Robin Smith and Cynthia Wutchiett
Charles D Beall	Laurie L Milford	
Charlie Fiddess	Lawson Yow	Rosemary Knight Gentry
Christel C Pretorius	Lazlo L. Muzikar	Sam Evans
Clint McKinght	Lesandre Holiday and Catherin Christensen	Sandra K York
Cynthia Patterson		Sarah Burris
Cynthia Ziegler	Lilly Zoller	Sarah Eller
Dan Sullivan	Linda Keenan	Sarah Marshall
Daniel Roman	Louise van Vonno	Sean Hackett
Dr. David C Noe	Marc Gubkin	Shamai Buckel
David Meade	Marilyn Stone	Sharon Bailey
Dr. David W Inouye	Mark M Waltermire	Shawn LaBounty
Dylan Fixmer	Margot Richardson	Shelley Schmitzer
Eileen Lyon	Marjorie Van Hoy	Steve Danuff
Ellen Moore	Marty Durlin	Stuart Kramer
Elyssa Edgerly	Mary George	Sue Navy
Emily and Paul St Ruth	Mary Jursinovic	Sue Morton
Emma Stopher-Griffin	Matthew Carpenter	Suzanne McMillan
Eric Sanford	Matthew Kremer	Tamara Herlitzka-Austin
Eruc Phillips	Megan Randall	Tanya Black
G. Marc Schevene	Melanie D Wolf	Thomas Bender
Gay T Austin	Melissa Munoz	Timber Moreland
Greg Hottinger	Michael P Burkley	Tom M Alvey
Gregory C Stap	Michael L Drake	Tracy E McCurdy
Hannah Rosenstein	Michael K Tarbell	Troy A Redding
Heidi Reese	Michelle Wilk	Troy E Sshenk
Jane and Charles McGarry Behrensmeyer	Nancy McManus	Tyler Sweeney
	Naropa Sabine	Viva B Kellogg
Janice Thorup		

Table F-5. Alphabetical List of Participants on a CHC Form Letter

Anne Schmidt	Elena Withers	John Schofield
April Selman	Elisa Greco	John Seipel
Avery Ellis	Elizabeth A Quist	Jon Reckling
Ben Wolcott	Elizabeth Keenan	Jonathan Hickam
Bernard Handler	Elizabeth Topper	Jonathon Stillman
Bernine Canape	Ellen Annette Choszczyk	Joseph Levine
Beth Skelton	Ellen Stapenhorst	Josh Roberts
Bettina Lord	Elyse Bell	Joy Kuhlman
Bob Johnson	Elyssa Edgerly	Joyce Schrieber
Bobby Riggs	Emily Matteson	Julie Sapena
Bonnie A Inouye	Emily St Ruth	Justin Hess
Brad Thacker	Emma Stopher-Griffin	Karrah Aegerter
Bradley	Erin Hilleary	Kate R Darlington
Brandy D Logan	Eugenie M McGuire	Kate Redmond
Brenda K Lockamy	Evelyn Grimm	Kathy Henderson
Brian Snider	Faye Sullivan	Kathy Hirschboeck
Brian Stratton	Fiona O'Donnell Pax	Kathy Thompson
Bridget E Weaver	Frederic and Deborah Mock	Katrina Debs
Bruce M Rider	Gail Srebnik	Lawrence Nowell
Candice Orlando	Gary R. Hall	Lawrence Ribnick
Carmela Courtney	Geoff Morton	Leah Rawson
Carol M Schoonhoven	Geoffrey Levens	Leah Rorick
Carol Pierce	George Lindsey	Leslie Levy
Carolyn Cipperly	Gerald Espinosa	Lincoln Vannah
Carolyn Ross	Jeanne Hergenrother	Linda Freimuth
Carrie Soto	Jennifer Berger	Linda R Maes
Carter Keegan	Jennifer Cipperly	Lindsey Thomas
Cedar Keshet-Fowler	Jennifer Eyler	Lisa Joss
Chaiah Sullivan	Jennifer Lukesh	Lis N. Ganora
Charles Spears	Jerry E Lockamy	Lisa Niermann
Chelsea Peluso	Jerry Rivers	Lisa Swartz
Chloe Marcellus	Jessica Thornberry	Lisa Tullio
Chris Dalbow	Jim Turner	Liz Reckling
Chris Haines	JJ Riggs	Lorayne Chen
Dr. David Inouye	Joanna Joslyn	Lucas Rocca
David Shishim	Joanna Reckert Gilbert	Lynn Mattingly
Deborah Matteson	Jerry Rivers	Lynn Wetherell
Denise Claire Laverty	Jessica Thornberry	Madeline Arrowood
Dianne Schevene	Jim Turner	Maggie Geck
Domenic Roti	JJ Riggs	Margaret Shishim
Don de Vries	John Ferrell	Margaret Stochosky
Doris Wehrmacher	John Moore	Margery Schab
Elaine Waters	John Rogers	Margot Richardson
Elena Goldstein	John S.J. Gregory	Marieta Bialek

Table F-5. Alphabetical List of Commenters on CHC Form Letter (continued)

Marilyn Stone	Melanie Finan	Robert Orlando
Mark Carlton	Melanie Wolf	Rosemary Bilchak
Mark Henry	Michael Burkley	Roslyn Bauer
Martin A Ulrich	Michael Munoz	Russell Evans
Mary Axelson	Michael P Arnold	Ryan Benjamin Lehman
Mary George	Michael Edson	Samuela Akert
Mary Hockenbery	Michael Soule	Sandra York
Mary Jursinovic	Michael Straub	Sarah Burke
Maggie Geck	Michele Miller	Sarah Eller
Margaret Shishim	Michelle Livingston	Sarah G Bishop
Margaret Stochosky	Michelle Pattison	Sarah Perez Sadler
Margery Schab	Micki K Rogers	Sawyer Spielberg
Margot Richardson	Miguel A Velez	Scott Horner
Marieta Bialek	Mike Brown	Scott Shishim
Marilyn Stone	Millicent Young	Sharon Kime
Mark Carlton	Millie Beall	Shawna Brown
Mark Henry	Miranda Eyler	Shawna Yaussi
Martin A Ulrich	Miriam Shaw	Sid Lewis
Mary Axelson	Mitchell Gershten MD	Simon Wain
Mary George	MJ Martin	Sue E. Dean
Mary Hockenbery	Moriah Whoolilurie	Sue Morton
Mary Jursinovic	Natalie Haines	Susan A Housel
Maggie Geck	Nicholas Turner	Susan Friar
Margaret Shishim	Nicole Carrillo	Suzanne Normandin
Margaret Stochosky	Nicole Greene	Sydney Shaw
Margery Schab	Nina Barrow	Tamra Gutshall
Margot Richardson	Nita Kubricht	Tanya Black
Marieta Bialek	Pamela D Schofield	Teresa Shishim
Marilyn Stone	Patricia Walsh-Oeinck	Thomas Kellogg
Mark Carlton	Pete Housel	Timber Moreland
Mark Henry	Pete Reese	Timothy Mitchell
Martin A Ulrich	Philip W. Davis	Timothy Mobley
Mary Axelson	Phyllis Velez	Tracy McCurdy
Mary George	Rachel L Schmitzer	Valarie Stucker
Mary Smith	Raye Levine	Valerie Stone
Matthew Allen Weaver	Rick Stelter	Vicente Perez Martinez
Matthew Kottenstette	Robert Haynes	Viva Kellogg
Meghan Gilroy	Robert Leuallen	Yvon Gros

Table F-6. Alphabetical List of Individuals and Organizations Submitting Scoping Comments

Last Name	*First Name*
Annala	Holly
Bauer	Roslyn
Bender	Thomas
Bernholtz	Johnna
Bishop	Sarah
Black	Tanya
Bradley	Dana
Brett	Elaine
Brett	Jim
Brooks	Melissa
Brown	Deborah
Brudzinski	David
Burkley	Michael
Burritt	Brad
Cain	Mary
Carpenter	Nicole
Carre	Deborah
Choszczyk	Ellen
Ciaglo	Max
Citizens for a Healthy Community	
Claire-Laverty	Denise
Classen, Jr.	Clayton
Clow	Jody Visconti
Coleman	Sarah
Coronor	Jim
Curtis	Victoria
Darlington	Kate
Davis	Philip
de Vries	Don
Dean	Katherine
Delaney	Adrian
Delaney	Lisa
Delta County Board of County Commissioners)	
Doe	Phillip
Dopchev	Petar
Drake	Michael
Dunkle	Doug
Eichelberger	Maeve
Ferrell	John

Last Name	*First Name*
Ferrell	Jack
Fischer	Mark
Fixmer	Dylan
Follingstad	Gretel
Fowler	Allen
Friar	Susan
Garrett	James L.
Garrett Leslie	Ethel
Gebavi	Ingrid
George	Mary
Glowka	David
Gobrecht	Charles
Goldberg	Dana
Goldstein	Elena
Goldstone	Beth
Gubkin	Marc
Gunnison Co. Board of Co. Commissioners	
Haines	Natalie
Halpern	Stuart
Hart (Wilderness Workshop)	Peter
Harte	Mary
Helleckson	Brent
Heuscher	Enno
Heuscher	Pauline
Hickenlooper (Combined Colo. Dept. Nat. Res. Comments)	Gov. John
Hoffman	Andrea
Holiday	Lesandre
Hornaday	Heidi
Hosier	Bailey
Hottinger	Greg
Hunker	Read
Inouye	Brian
Johnson (Western Slope Conservation Center)	Alex
Johnson	Benjamin
Johnson	Betsy
Johnson	Mick
Jones	Lisa

Last Name	*First Name*
Joss	Lisa
Jursinovic	Mary
Kassoff	Jason
Keahon	Christopher
Kellogg	Viva
Kellogg	Scott
Kellogg	Scott
Ketterhagen	William
Kluck	Steven
Knight (Town of Paonia)	Kenneth
Kolbenschlag (Colorado Farm and Food Alliance, et al.)	Ken
Kreykes	Daniel
LeBounty	Shawn
Leger	Natasha
Levens	Geoffrey
Levy	Leslie
Lewis	Sid
Lindsey	Linda
Lindsey-Wolcott	Ben
Livingston	David
Lukesh	Jennifer
Lyons	Steve
MacDonald	Clay
Mann	Brianne
Mason	John
Maxwell	Brandon
McCoy (U.S. Environmental Protection Agency)	Melissa
McIntosh	Tom
McPherson (Grassroots Coaltion)	Patricia
Meade	David
Miller	Edna
Morse	Dan
Mundt	Alissa
Munoz	Melissa
Nasr	Katja
Nasr	Sammy
Navy	Sue
Niermann	Lisa

Last Name	*First Name*
Niermann	Erich
Niermann	Lisa
Obrien	Colleen
Oliver	
Ortiz	Karen
Paigen	Joshua
Paigen	Paigen
Peterson	Ruth
Petito	Jackson
Phillips	Benita
Phillips	Thomas
Pierce	Carol
Pretorius	Christel
Proteau	Zorba
Purves (Trout Unlimited)	Cathy
Raleigh	Chuck
Randall	Megan
Reich	Debra
Reily	Katie
Riggs	Skye-Laurel
Riley	Michelle
Roberts	Josh
Rochardt	Laurie
Roush	William
Sabine	Naropa
Schachter	Sumner
Schevene	Dianne
Schmidt	Sarah
Schrieber	Joyce
Scott	Cody
Shelton	Taylor
Shishim	Margaret
Slivka (The Wilderness Society et al.)	Juli
Smith	Robin
Smith	Paige
Smith	Mary
Sorensen	Cindie
Stern	Lydia
Stevens	Michael
Stone	Marilyn

Last Name	*First Name*
Stopher	Dana
Stopher-Griffin	Emma
Straub	Mike
Stuart	Belinda
Swackhamer	Phyllis
Thacker	Brad
Thomann	Sharon
Thompson	Greg
Thompson	Kathryn
Tisdel (Western Environmental Law Center)	Kyle
Trickey	Harry
Trumble	May
Tschinkel	Christopher
Vannah	Lincoln
Vessels	Thomas
Vogel	Kate
Walsh-Oeinck	Patricia
Waltermire	Mark
Wassell	Emily
Wegner	Brian
Whoolilurie	Moriah
Wicks	Nancy
Wilk	Michelle
Williams	Chelsea
Witherell	Deidre
Wolcott	Steve
Wolcott	Eli
Woodside	Bruce
Yale	Laura
Yates	Laura
York	Sandra
Young	Millicent
Ziegler	Cynthia
Zoller (Conserv. Colo. Edu. Fund)	Lilly